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THE UNIVERSITY OF MISSOURI BULLETIN

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EDUCATION SERIES
Volume 1 Number 1

CIRCULAR OF INFORMATION
TO
ACCREDITED SCHOOLS

ISSUED BY THE COMMITTEE ON ACCREDITED SCHOOLS

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UNIVERSITY OF

FIFTH EDITION, REVISED

UNIVERSITY OF MISSOURI
COLUMBIA, MISSOURI
June, 1911

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INTRODUCTORY.

Organization is the order of the day. In education, as in commerce, it is indispensable to the greatest efficiency. To prevent wasted energy and discouragements which turn many young people from the pathway of their highest development, demands a closer co-operation of the educational forces of the State. This truth is now generally recognized; and, as a result, the efficiency of education in Missouri has been rapidly increasing. County supervision and articulation of elementary and high schools are phases of a general movement which includes also the affiliation of high schools and University, so that there may be a pathway direct from the primary school of any community to the highest educational opportunities offered by the State. For the same reason that high schools must take the initiative in solving the problem of articulating elementary and secondary schools, the University must take the initiative in solving the problem of affiliating high schools and University. Accordingly, in view of a growing demand for organization, the University presents a plan, modified by several years of careful, direct study of the school situation, whereby graduates of secondary schools may be admitted to the University without entrance examinations.

This plan necessarily includes a definition of conditions for accrediting. In determining these conditions, it has been the policy of the University to consider in the broadest sense the welfare of high schools. Due recognition has been made of the facts that most graduates of secondary schools do not attend institutions of higher learning, that local conditions vary, and that many schools meet with most discouraging difficulties. It is desirable that high schools have the greatest possible freedom consistent with the purpose of affiliation, and it is the intention of the University to cooperate with them rather than arbitrarily to impose conditions upon them. Accordingly, criticisms of the plan here offered are invited. The administration of this plan requires the examination of each school by an educational expert, whose advice may be taken advantage of by local authorities who wish to improve their schools. This method of affiliation has been justified by the rapid development of many Missouri schools under its influence. As mutual understanding, confidence and co-operation more widely increase, even greater progress is promised for the future.

This circular is prepared for the information of superintendents, principals, teachers and members of school boards who wish to co-

6. The school must give satisfactory instruction in the following subjects:

English	3 units.
Mathematics	2 units.
History	2 units.
One Foreign Language (Latin, Greek, French, German or Spanish)	2 units.
*Science (General Biology, Zoology, Botany, † Physiology, Chemistry, Physics, Physical Geography or Agriculture)	2 units.

In addition to the above, at least four (4) units to be selected from the subjects named in the following list, in which the maximum and minimum number of units accepted in each is indicated:

Subjects	Maximum	Minimum	Subjects	Maximum	Minimum
English	4	3	Chemistry	2	1
Algebra	1½	1	General Biology	1	1
Plane Geometry	1	1	Zoology	2	1
Solid Geometry	½	½	Botany	2	1
Trigonometry	½	½	†Physiology	1	1
‡Arithmetic (advanced)	½	½	Physical Geography	1	1
‡Algebra (advanced)	½	½	Agriculture	1	1
History	4	1	Music	1	1
Civil Government	½	½	Drawing	2	1
Latin	4	2	Manual Training	2	1
Greek	3	2	Domestic Science and Art	2	1
German	3	2	Economics	½	½
French	3	2	Commercial Geography	½	½
Spanish	3	2	Bookkeeping	1	1
Physics	2	1			

* Domestic Science and Art will be accepted as one of the two required units in Science, provided that the other unit is not Agriculture.

† In cases where the study of Physiology has been preceded by a year's study of Biology.

‡ The courses in advanced Arithmetic and advanced Algebra are not approved, if they are not preceded by those in elementary Algebra and Plane Geometry.

By a "unit" is meant a year's work in a subject, with five (5) periods a week. Three (3) periods a week for two years will be accepted as the equivalent of a unit.

By a "period" is meant not less than forty (40) minutes of time devoted to actual teaching. In science and manual arts, of the five (5) periods, at least two (2) double periods of not less than eighty (80) minutes each must be devoted to laboratory work.

Secondary schools which maintain a four years' course of study, but do not fulfill all the requirements for a fully accredited school, may be partially accredited.

The University reserves the right to cease to accredit, at any time, a school that employs inefficient teachers or that otherwise fails to maintain the required standard.

I.

OUTLINE OF APPROVED SUBJECTS.

ENGLISH.

FOUR UNITS MAY BE OFFERED.

Literature. It is recommended that one-half of the time allotted to English be given to the study of literature, by which is meant not the study of a manual on the history of literature, but literature itself in the selected works of representative authors. Masterpieces as a whole, suited to the attainments of the class, should be read in class and carefully examined, while other works may be assigned as collateral readings, of which reports, written or oral, should be required. In the fourth or last year, in connection with a wider range of reading in literature, a brief history of the literature may conveniently be used.

English Grammar. Everywhere pupils enter the high school with an inadequate knowledge of English grammar. The systematic study of grammar, therefore, as the foundation of higher scholarship in English, should be pursued in the high school. An accurate knowledge of grammar and of grammatical analysis is often indispensable to the right interpretation of literature and to confident correctness in composition. Without strict grammatical training the pupil finds himself at a disadvantage in trying to grasp the meaning of an involved sentence as well as in the attempt to express without ambiguity his own thoughts.

The method of teaching grammar should almost invariably be inductive. By making use of the pupil's own words and sentences, his reading, and his composition, one can easily establish the simpler definitions, rules, and principles of grammar. As each point is made, it will be well to refer to a text-book by way of confirmation of what has been found. Following upon this, drill exercises, drawn from the text-book, could be used to advantage. The study of grammar should never become merely formal. All definitions, classifications, and rules should be seen to grow out of, and ever refer back to, words and sentences. The object of the work is not that one may be able to define the parts of speech and state rules, but that he may understand the logic of the sentence. All parsing and analysis should be made a study in relations among words and sentences. Diagrams are of little real aid, and are likely to create a wrong impression of the purpose of the work. No pupil should be graduated who cannot analyze correctly a normal English sentence of moderate complexity.

Composition and Rhetoric. Training in the use of the language should be a part of the work in English throughout the course. The English, spoken and written, of the pupils should be watched and corrected not only in their English classes, indeed, but in all their written work. The principles governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered. In the English classes, it is advised that set exercises be required every week for the first two years, and, in the third and fourth years, in addition to these exercises, a carefully prepared paper at least once a month; that a due proportion of the class time be devoted to the discussion of these exercises and to explanation of the simpler rules of good writing; and that the exercises be then re-written with correction of errors. The pupil's work in literature, his other studies, and his daily experiences will furnish abundant topics for these exercises. It is most earnestly urged upon teachers that a certain standard of skill in writing be established for each year, and that no pupil be advanced to a higher class in English until he has reached that standard in his written work.

The list of readings in literature recommended by the National Conference on Uniform Entrance Requirements in English at its last meeting (February 22, 1909) for the years 1913-15, and approved by the English department of the University, is as follows:

"*a.* READING. The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

"With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units[1] are to be selected, two from each group:

"I. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey*, *Iliad*, and *Aeneid* should be read in English translations of recognized literary excellence.

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[1] Each unit is set off by semicolons.

For any unit of this group a unit from any other group may be substituted.

"II. Shakespeare's *Merchant of Venice; Midsummer Night's Dream; As you Like It; Twelfth Night; Henry the Fifth; Julius Caesar.*

"III. Defoe's *Robinson Crusoe, Part I;* Goldsmith's *Vicar of Wakefield;* either Scott's *Ivanhoe,* or *Quentin Durward;* Hawthorne's *House of the Seven Gables;* either Dickens's *David Copperfield,* or *Tale of Two Cities;* Thackeray's *Henry Esmond;* Mrs. Gaskell's *Cranford;* George Eliot's *Silas Marner;* Stevenson's *Treasure Island.*

"IV. Bunyan's *Pilgrim's Progress, Part I;* the *Sir Roger de Coverley Papers* in the *Spectator;* Franklin's *Autobiography* (condensed); Irving's *Sketch Book;* Macaulay's *Essays on Lord Clive* and *Warren Hastings;* Thackeray's *English Humorists;* Selections from Lincoln, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and Letter to Horace Greeley, along with a brief memoir or estimate; Parkman's *Oregon Trail;* either Thoreau's *Walden,* or Huxley's *Autobiography* and selections from *Lay Sermons,* including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk; Stevenson's *Inland Voyage* and *Travels with a Donkey.*

"V. Palgrave's *Golden Treasury* (First Series), *Books II and III,* with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's *Elegy in a Country Churchyard* and Goldsmith's *Deserted Village;* Coleridge's *Ancient Mariner* and Lowell's *Vision of Sir Launfal;* Scott's *Lady of the Lake;* Byron's *Childe Harold,, Canto IV,* and *The Prisoner of Chillon;* Palgrave's *Golden Treasury* (First Series), *Book IV,* with especial attention to Wordsworth, Keats, and Shelley; Poe's *Raven,* Longfellow's *Courtship of Miles Standish,* and Whittier's *Snow-Bound;* Macaulay's *Lays of Ancient Rome* and Arnold's *Sohrab and Rustum;* Tennyson's *Gareth and Lynette, Lancelot and Elaine,* and *The Passing of Arthur;* Browning's *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City.*

[The list for 1912 differs in many points from that for 1913-15, being nearly the same as that for 1910-11. For the 1911 list, see the University Catalog for 1910-11. Nearly all the publishers of English school texts issue these lists in convenient form, and will send them on application. For the full official report of the 1909 Conference, address Mr. Wilson Farrand, Newark Academy, Newark, N. J.]

"*b*. STUDY. This part of the requirements is intended as a natural and logical continuation of the student's earlier reading.

with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. For this close reading are provided a play, a group of poems, an oration, and an essay, as follows:

"Shakespeare's *Macbeth;* Milton's *L'Allegro, Il Penseroso,* and *Comus;* either Burke's *Speech on Conciliation with America,* or both Washington's *Farewell Address* and Webster's *First Bunker Hill Oration;* either Macaulay's *Life of Johnson* or Carlyle's *Essay on Burns.*"

The Course of Study. The suggested course outlined below covers four years, and each year is divided into two terms.

It provides for the study of grammar, composition, and literature in suitable proportions. It attempts also to assign to a suitable place in the four years' course each item in the Conference list of readings. Titles *starred* are recommended for class room study, the others for outside reading. All the literature in the Conference list may well be read in the course of the four years.

Figures following the different subjects indicate the proportion of the whole English time (five periods a week) of the term to be given to each subject. They do not mean that in each week so much time shall be given to grammar, so much to composition, and so much to literature. On the contrary it is better, both in grammar and in literature, to work intensively, giving consecutive class periods to one topic until it is mastered and then proceeding similarly with another. Drill in the conventional usages of composition, on the other hand, involving as it does the acquiring of habits, should be kept up steadily alongside of the other studies.

FIRST YEAR.

First Half.—(Grammar 2, composition 2, literature 1.)

GRAMMAR—The parts of speech; subject and predicate.

COMPOSITION—Exercises in capitalization, punctuation, and sentence form. Invention, oral and written, in connection with the literature read. Letter-writing.

LITERATURE—*The Lady of the Lake**; Treasure Island; Arabian Nights; Ivanhoe; Iliad; Tale of Two Cities; Last of the Mohicans; Old Testament Stories* (H. M. Co.).

Second Half.—(Grammar 3, composition 1, literature 1.)

GRAMMAR—Number; case and case relations; transitive and intransitive verbs; complements of the verb; tense; passive voice; compound verb-forms; sentence, clause, and phrase; relatives.

COMPOSITION—Exercises in punctuation and sentence-form continued. Paragraph division and paragraph development. Original work in narration and description on subjects suggested by the literature read.

LITERATURE—*Vision of Sir Launfal*; Snow-Bound*; Odyssey; Kidnapped;* Lamb's *Tales from Shakespeare; Rip Van Winkle;* Franklin's *Autobiography; Quentin Durward; Robinson Crusoe.*

SECOND YEAR.

First Half.—(Grammar $\frac{1}{2}$, composition 2, literature $2\frac{1}{2}$.)

GRAMMAR—Classification of sentences (simple, complex, compound; declarative, interrogative, exclamatory).

COMPOSITION—Exercises in sentence form, punctuation, and vocabulary. Correction of vulgar errors of speech and writing. Unity and coherence of paragraphs. Invention, oral and written, on topics drawn from the pupil's experience.

LITERATURE—*As You Like It*; Merchant of Venice*; Southey's Life of Nelson;* Butler's *Gordon* (Macmillan's Men of Action Series); *Kenilworth; House of Seven Gables; The Deserted Village.*

Second Half.—(Composition 2, literature 3.)

COMPOSITION—Review of punctuation, with special attention to comma, semicolon, full stops, and quotation marks. Constructive exercises in different types of sentence form. Repetitive exercises upon the literature read, to enlarge the vocabulary.

LITERATURE—*The Ancient Mariner*; The Passing of Arthur*; David Copperfield; Lorna Doone;* the *Aeneid; A Christmas Carol* and *The Chimes; Cricket on the Hearth; Golden Treasury III and IV*.*

THIRD YEAR.

First Half.—(Composition 2, literature 3.)

COMPOSITION—Exercises in invention, descriptive or narrative. The whole composition: its theme (unity), and its plan (sequence). Outlines drawn up, and developed both orally and in writing, on topics drawn either from reading or from experience. Study of the connotation of words.

LITERATURE—*Midsummer Night's Dream; Idylls of the King*; Twelfth Night; Sketch Book; Succession of Forest Trees*; Travels with a Donkey; DeCoverley Papers; The Tempest; The Black Arrow; Esther, Ruth.*

Second Half.—(Grammar 1, composition 2, literature 2.)

GRAMMAR—Mood and the modal auxiliaries; the participle and the infinitive

COMPOSITION—Exercises in invention, expository and argumentative. The making of outlines by analysis of propositions; paratopic-sentences and their development; transitions: emphasis by arrangement; how to gather material from experience, observation, reading, and reflection; the right use of reading in original composition; the MS. conventions of citation, quotation, and reference; accuracy of diction.

LITERATURE—*Pied Piper and Browning's Shorter Poems**; *Sketch Book; Washington's Farewell Address**; Webster's *First Bunker Hill Oration;* Parkman's *Oregon Trail; Golden Treasury II**; Selections from Lincoln; *Dr. Jekyll and Mr Hyde; Genesis, Exodus, Joshua,* and *Judges.*

FOURTH YEAR.

First Half.—(Grammar 1, composition 1, literature 3.)

GRAMMAR—General review of sentence analysis; idioms and vulgarisms; principles of etymology.

COMPOSITION—Original written work confirming the principles and methods learned in the third year, with special attention to vocabulary and thought development.

LITERATURE—History of English literature to Milton; *Macbeth**; *Henry V; L'Allegro**; *Il Penseroso**; *Lycidas**; Selections from Wordsworth and Burns; Plato's *Apology*†, *Crito*, and *Phaedo*†; *Autocrat of the Breakfast Table;* DeQuincey's *Joan of Arc and The English Mail Coach**.

Second Half.—(Composition 1, literature 4.)

COMPOSITION—Review of the mechanics of written form and the chief details of good use, with drill as found necessary. Rhetorical types of sentences. Original written work based on study and reflection; oral debate.

LITERATURE—History of English literature from Milton to the present; *Beowulf* (in translation); *Golden Treasury I**; *Julius Caesar**; *Henry VIII; Cotter's Saturday Night;* Carlyle's *Burns; Tintern Abbey**; Walden; Burke's *Speech on Conciliation with the Colonies**; *The Scarlet Letter; Romola.*

For library equipment, see pages 75-80.

MATHEMATICS.

FOUR UNITS MAY BE OFFERED.

The four units which may be offered in mathematics are as follows:

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† Pauls More's translation; Houghton, Mifflin.

Algebra. One unit. Elementary Algebra, including the elementary operations, fractions, solutions of single and simultaneous linear equations with applications, simple factoring, simple radicals, exponents, and the solution of numerical quadratic equations. Graphical methods should be used wherever they assist in the comprehension of the subject.

One and one-half units. Complete elements of Algebra, including the above, and in addition, solution of simultaneous quadratics, chiefly by graphical processes, of higher equations solved as quadratics, of problems whose solution depends upon quadratics; the formation of equations with given roots; the binomial theorem for *positive integral exponents;* practical use of logarithms; ratio and proportion and other simple work on variation. For more detailed outline see the report of the committee of the State Teacher's Association, Joplin meeting, 1907.* The text should cover the ground in the best algebras, preferably the newer books which contain work on graphs. Books which do not contain all the above mentioned material may be sufficient for the first unit, but not for the unit and a half.

Plane Geometry. One unit. The work in Plane Geometry, in order to be acceptable, *must cover a full year in some good text.* It is recommended that strong emphasis be placed on a very few of the most important theorems, such as the congruence theorems, the similarity theorems, the Pythagorean theorem, etc., and that the student be led to see that he need not remember many of the lesser theorems provided he knows how to get them whenever he wants them by reference to these larger theorems. The student should thus see that the logic of the subject plays a large part in assisting the memory and in relieving the memory from unnecessary burdens. Original demonstrations should form an important part of the work. It is recommended that informal proofs be accepted for some of the most obvious theorems and that the notion of a strictly logical proof be developed gradually as the student can be led to see the need for such proof. The theory of limits and the proofs for the incommensurable cases may be omitted or only briefly explained by the teacher. It is recommended that part of the year be spent on the applications of Algebra to Geometry and of Geometry to Algebra. The connection between Algebra and Geometry now established in the graphical and concrete work in Algebra should not be forgotten. The student's knowledge of Algebra may be kept alive and even slightly extended, and his appreciation of its value greatly strengthened by frequent incidental use throughout the course in Geometry. It is highly desirable that the student should gain in the grades and in connection with the concrete work in Algebra an intimate practical acquaintance with many of the facts of Geometry that he may not be confronted with entirely new subject-matter at the same time that he is mastering the logical methods of Geometry. A specially favorable opportunity to make Geometry seem of real value to the student consists in the applications of the theorems on similar triangles to the graphical solution of triangles by drawing them to scale and measuring the unknown parts with ruler and protractor. In this connection the simplest notions of Trigonometry may be introduced with profit. A small ten cent table of logarithms and trigonometric functions may be obtained.* Familiarity with such a table will do much to enliven the work, and incidentally pave the way for an easier understanding of Trigonometry. For a detailed discussion of these questions, see the report on Geometry which will be presented to the National Education Association in the summer of 1911.

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*This can be found in School Science and Mathematics, April, 1908, or may be obtained free from the Secretary of the Missouri Society of Teachers of Mathematics and Science, 208 Thilly Avenue, Columbia, Missouri.

Arithmetic. One-half unit. This half unit will not be approved unless it is given *after* the completion of the elementary courses in Algebra and Geometry. An extended variety of topics is by no means so desirable as a careful study of the meaning of the simpler and more fundamental processes of Arithmetic, together with application to problems drawn as widely as possible from Geometry, Physics, Mensuration, and other subjects with which the student is already familiar. Algebraic forms of thinking may well be used where these assist in understanding the subject.

Algebra. Additional half unit. This half unit will not be approved unless it is given *after* the completion of the elementary courses in Algebra and Geometry. The spirit of the work offered for this half unit should be the same as that indicated in the above outline for Arithmetic. In particular, the close relation of Algebra to Arithmetic and Geometry should be emphasized.

Solid Geometry. One-half unit. The work in Solid Geometry should cover a full half year's work. The development of the student's space conception is a valuable aim in the work, and it may well be aided by the construction and study of models and by the experimental verification of theorems.

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*These may be obtained from the Co-operative Store, Columbia, Missouri.

Trigonometry. One-half unit. This is supposed to cover a half year's work. It should include the elementary notions, logarithms, functions of obtuse angles, solution of right-angled triangles, some work in oblique triangles, and some familiarity with the formulas involving two angles.

For library equipment, see pages 80-81.

HISTORY.

FOUR UNITS MAY BE OFFERED.

The course of study recommended consists of a full year's work, five periods a week of forty minutes each, in each of the four fields of history—Ancient, Medieval and Modern, English, and American. In order to develop in the pupils the sense of historical unity and growth, the course of study should be so planned as to have one period or field succeed another in natural sequence. Accordingly, the course should begin with a year's work in Ancient History and this be followed by a second year devoted to Medieval and Modern History. The third year will, naturally, be devoted to English History, and the fourth to American History and Civil Government. If desired, English History may be given in the second year and Medieval and Modern in the third year, without seriously affecting the continuity or value of the instruction. A reason for such transposition may be found in the relative difficulty of the two courses, both from the teacher's and pupil's standpoints.

For a three years' course of study, Ancient History should be followed in the second year by Medieval and Modern History, with attention to English History as a part of the field, or by English History, with attention given to continental European history, and in the third or fourth year American History, or American History and Civil Government, should be studied.

A two years' course should comprise a year's work in Ancient History followed by a year of Medieval and Modern History. Such a brief course, however, is not recommended, and accredited schools offering but two units should make every effort to add another year's work is history to their programme, or, better still, two years additional.

The following brief statements in regard to the several units will serve to indicate the scope of the course and the type of text-books acceptable to the University.

(1) *Ancient History. One Unit.* The completion of a careful and thorough course of study extending over one entire school year in Oriental, Greek, and Roman history. The list of text-books given below will indicate the type of books acceptable as the basis for this course:

Botsford, *Ancient History for Beginners*, Macmillan	$ 1.50
Goodspeed, *History of the Ancient World*, Scribner	1.50
Morey, *Outline of Ancient History*, American Book Co.	1.50
Myers, *Ancient History*, Revised Edition, Ginn & Co	1.50
West, *The Ancient World*, Allyn & Bacon	1.50
Wolfson, *Essentials in Ancient History*, American Book Co.	1.50

(2) *Medieval and Modern History. One Unit.* A year's study of the history of the European nations and their development and institutions from the period of the Germanic invasions to the close of the nineteenth century. The course should be based on a standard high school text such as:

Adams, *Mediaeval and Modern History*, Macmillan	$ 1.10
Bourne, *Mediaeval and Modern History*, Longmann, Green	1.50
Harding, *Essentials in Mediaeval and Modern History*, American Book Co.	1.50
Munro and Whitcomb, *Mediaeval and Modern History*, Appleton	1.50
Myers, *Mediaeval and Modern History*, Revised Edition, Ginn & Co.	1.50
Robinson, *History of Western Europe*, Ginn & Co.	1.60
Thatcher and Schwill, *General History of Europe*, 350—1900 A. D., Scribner	1.50
West, *Modern History*, Allyn & Bacon	1.50

(3) *English History. One Unit.* A thorough study of English political, governmental, economic and social history extending through one full school year and based on any standard text-book such as:

Andrews, *History of England*, Allyn & Bacon	$ 1.50
Cheyney, *Short History of England*, Ginn	1.40
Coman and Kendall, *History of England*, Macmillan	1.25
Larned, *History of England*, Houghton, Mifflin	1.25
Terry, *History of England for Schools*, Scott, Foresman (Chicago)	1.40

Tout, *Advanced History of England*, Longmann, Green	1.50
Walker, *Essentials in English History*, American Book Co.	1.50
Wrong, *History of the British Nation*, Appleton	1.40

NOTE.—A half unit in English History will be given for a shorter course of study based on less advanced texts such as Higginson and Channing's *History of England;* Ransome's *Short History of England*, and Montgomery's *English History.* The half-unit course is not recommended, however, and the half-unit course should be given only when it is impossible to devote a full year to the subject.

(4) *American History. One Unit.* This course should embrace a year of advanced work in American political, social and institutional history with special reference to the period since 1763. The following text-books suggest a standard for this course:

Adams and Trent, *History of the United States*, Allyn & Bacon	$ 1.50
Ashley, *American History*, Macmillan Co.	1.50
Channing, *Student's History of the United States*, Macmillan	1.40
Hart, *Essentials of American History*, Amer. Book Co.	1.50
Larned, *History of the United States*, Houghton, Mifflin	1.40
McLaughlin, *History of the American Nation*, Appleton	1.40
Montgomery, *Student's American History*, Ginn	1.40

NOTE.—A half-unit in American History will be given for a briefer, or half year, course of an advanced character but less comprehensive in scope. Such a course is not recommended, however, save in connection with the half-unit in Civil Government.

For list of maps and library equipment, see pages 81-93.

CIVIL GOVERNMENT.

ONE-HALF UNIT MAY BE OFFERED

Course of Study. Systematic instruction in Civil Government should be postponed to the last year of the course of the secondary school. There is a distinct advantage in this plan. If given in the earlier years the work would be largely a review of what had been done in the last year of the elementary school. Still more important is the consideration that the senior in the secondary school is a much better subject for such instruction than are pupils in the first and second years. He will be much more appreciative of the spirit and content of the course.

Civil Government should be given as a distinct course and not as a part of the work in American History. History, however, is so essential to good results in the teaching of government that credit will not be given for work in Civil Government unless it is preceded by at least one-half year's work in American History. The best plan is to offer Civil Government in the second half of the senior year following American History in the first half of such year. It is recommended, moreover, that during the earlier years of the course much incidental instruction in Civil Government should accompany the work in History and Geography. Emphasis should be placed upon the historical development of political institutions in order that the pupil may be brought to a true understanding of what may otherwise appear arbitrary and irrational.

Methods of Instruction. The course should begin with a study of local government. The pupil can be made to understand local institutions much more readily than those of the state or nation since the former come within the range of his personal experience. In his daily life he is brought into contact with organs and activities of local government and these should be seized upon by the teacher as object lessons to illustrate the work of the course. The city will furnish the best and most numerous illustrations of this character. It will be relatively an easy matter to excite the curiosity and arouse the interest of the pupil in governmental organs which he can see and whose activities are brought home to him. In this way he will receive a real training in citizenship. From the institutions of the city it will be possible to proceed in like manner to those of the county, state and nation.

The pupil's interest in the work can be retained and heightened by visits to places which have to do with governmental activities. The city hall, public water and lighting plants, the public library, post-office, the school itself,—all will furnish excellent means for illustrating the work in Civil Government. The pupil should be encouraged to study the government of his city and make reports upon various phases of its organization and work, e. g., the mayor, city clerk, street improvement, lighting, etc. The work in Civil Government may also be supplemented by having the school debating societies discuss questions of civic interest.

A good text-book is desirable. In many cases its arrangement may not correspond to the above plan but it will be possible to take up the parts of the text in a different order from that in which they are presented. The text-book must be largely supplemented by the teacher and by collateral reading and reference work. A small reference library is essential.

For library equipment, see pages 93-95.

LATIN.

FOUR UNITS MAY BE OFFERED.

The student should acquire such a vocabulary and such a knowledge of inflections and syntax as to read readily simple Latin prose with accurate quantitative pronunciation of the words. He should be carefully trained in reading Latin aloud, with proper emphasis and expression, and in rendering Latin into choice, idiomatic English. In connection with the reading, there should be some practice in writing Latin, and in making frequent written translations. Sight reading should be made a frequent exercise.

The *first year* should be spent in thoroughly mastering the elements of the language as given by such beginners' books as Bennett's, Collar and Daniell's, or Pearson's.

During the *second year*, four books of Caesar's *Gallic War* should be read.

An equivalent of Nepos, Viri Romae or Eutropius may be substituted for one book of Caesar, if the pupils need some simple Latin as a bridge. This is not recommended, however, unless it is absolutely necessary. An equivalent amount of Caesar's *Civil War* may be read instead of the *Gallic War*. This is recommended especially in the case of classes in which a large number are going over the year's work a second time. The reading should be accompanied by a careful and systematic review of grammatical forms and by a study of the leading principles of syntax. The latter should be impressed upon the pupil's mind by the translation into Latin of English sentences, based upon the text read. One exercise a week should be given entirely to this composition work, in which the marking of all long vowels should be insisted on.

During the *third year* the following orations of Cicero are usually read: four orations against Catiline, the oration for the Manilian Law, the oration for the Poet Archias. Instead of these, an equivalent may be read in Sallust's *Cataline* or *Jugurtha*. The grammar and composition work of the preceding year should be continued.

It is recommended that the *fourth year* be begun by the reading of about a thousand lines of Ovid's *Metamorphoses*. This is to be followed by four or five books of Vergil's *Aeneid*. If only four are read, an equivalent in the *Eclogues* or *Georgics* should be read. If desired the whole year may be devoted to reading six books of the *Aeneid*. The technique of the Latin hexameter should be taught and its rhythm should be felt as quantitative and not merely translated into an accentual rhythm.

In connection with the reading of Latin, the mythology of the Greeks and Romans and the life and history of the Roman People should be thoroughly taught. Map drawing is valuable for impressing upon the mind the geography of the ancient world.

For library equipment, see pages 96-103.

GREEK,

THREE UNITS MAY BE OFFERED.

The three units that may be offered in Greek are as follows:

First. Introductory lessons:

Xenophon's *Anabasis* (20 to 30 pages).

Practice in reading at sight and in writing Greek.

Systematic study of grammar begun.

Second. Xenophon's *Anabasis* (continued), either alone or with other Attic Prose (75 to 100 pages).

Practice in reading at sight, systematic study of grammar, thorough grammatical review, and practice in writing Greek, both based on study of Books I and II of the Anabasis.

Third. Attic Prose; e. g., Lysias' *Orations*, or Plato's *Apology and Krito*, or Xenophon's *Memorabilia*, with practice in writing Greek; grammar, practice reading at sight.

Homer (2500 to 4000 lines); e. g. *Odyssey* Books I-V, or *Iliad* Books I-III (omitting 11,499-end), and VI-VIII.

Useful text books for the above work are:

1. For the *first year's* work;
Ball's *Elements of Greek*, Macmillan.
White's *First Greek Book*, Ginn.
Gleason and Atherton's *First Greek Book*, Amer. Book Co.
Gleason's *Gate to the Anabasis*, Ginn.

2. For the *second year's* work;
Smith & Bonner, *Xenophon's Anabasis*, D. Appleton.
Goodwin and White's *Xenophon's Anabasis*, Ginn.
Goodwin's *Greek Grammar*, Ginn.
Pearson's *Greek Prose Composition*, Amer. Book Co.

3. For the *third year's* work;
Morgan's *Eight Orations of Lysias*, Ginn.
Wait's *Ten Select Orations of Lysias*, Amer. Book Co.
Bristol's *Ten Selected Orations of Lysias*, Allyn and Bacon.
Adams, *Selected Speeches of Lysias*, Amer. Book Co.
Flagg's *Apology and Krito of Plato*, Amer. Book Co.
Smith's *Xenophon's Memorabilia*, Ginn.
For library equipment, see pages 96-103.

GERMAN.

THREE UNITS MAY BE OFFERED.

(1) The *first unit* should comprise: (a) Careful drill upon pronunciation. (b) Systematic drill upon the elements of grammar, including the inflection of the articles, the noun, the adjective, the pronoun, the verb, strong and weak; also upon the use of the common prepositions, the simpler use of the modal auxiliaries and elementary rules of syntax and word-order. (c) The reading of from 100 to 150 pages of easy texts, chiefly modern prose, with especial stress laid upon acquiring a good working vocabulary. (d) Abundant practice (1) in oral and written reproduction of the text, (2) in the memorizing of colloquial and idiomatic phrases, and (3) in dictation. Thoroughness should be insisted upon rather than quantity. Texts such as the following are recommended: (1) Guerber's *Märchen und Erzählungen I*, (2) Seeligmann's *Altes und Neues*, (3) *Glück Auf*, (4) the easiest of Grimm's *Märchen.*

(2) The *second unit* calls for about 300 pages of moderately difficult reading, chiefly prose, with constant practice in oral and written reproduction of selected portions; also drill upon the more difficult chapters of grammar such as the passive voice, use of cases with prepositions, verbs, adjectives, uses of tenses and modes (especially the infinitive and subjunctive), likewise upon word-order, and word-formation. Thoroughness should be insisted upon rather than quantity. The following texts are among those recommended: (a) For reading, Baumbach's *Sommermärchen* and *Waldnovellen*, Leander's *Träumereien*, Zschokke's *Der zerbrochene Krug*, *Das Wirtshaus zu Cransac*, Storm's *Immensee*, Heyse's *L'Arrabiata;* (b) for composition, Pope's *Composition*, Stern's *Geschichten vom Rhein*, Bacon's *Im Vaterland.*

(3 The *third unit* calls for: (a) The reading of from 400 to 500 pages of good modern prose stories and plays and the ability to use the language effectively as a means of oral and written expression; (b) Abundant practice in the writing of compositions. Among the texts recommended are Benedix' *Der Prozess*, *Die Hochzeitsreise*, Moser's *Der Bibliothekar*, Manley and Allen's *Four German Comedies*, Storm's *Der Schimmelreiter*, Riehl's *Burg Neideck*, Sudermann's *Frau Sorge*, Freytag's *Die Journalisten*, Helbig's *Komödie auf der Hochschule.*

For library equipment, see pages 103-106.

FRENCH.

THREE UNITS MAY BE OFFERED.

In general throughout the course the teacher should aim at quality rather than quantity.

1. The work of the *first year* should aim to give the student: (a) an accurate pronunciation; (b) a knowledge of the rudiments of the grammar; (c) the ability to translate simple sentences into French and to express in idiomatic French simple ideas; (d) the ability to understand simple ideas expressed orally in French; (e) a vocabulary and knowledge of construction sufficient to enable him to read ordinary French with considerable ease.

The drill in pronunciation should begin with the first meeting of the class and should continue unremittingly until the last. It is not only an end in itself but it makes for accuracy in the knowledge of grammatical forms and is a great aid in the retention of vocabulary. As a part of such drill frequent dictations are indispensable.

The grammatical work should include the regular and the more common irregular verbs, the inflection of nouns, adjectives, participles, and pronouns, the use of pronouns, adverbs, prepositions, and conjunctions, sentence-order, and the elements of syntax. The amount studied should be about that covered in Thieme and Effinger's *Grammar*, the first part of Fraser and Squair's *Grammar*, Aldrich and Foster's *Elementary French*, or Chardenal's *First French Course.*

A minimum of about 150 pages should be read. There are a number of readers which present a sufficient variety of graded material and some of the easier of the texts mentioned below as suitable for the *second year* could be used profitably. There should be constant practice in translating into French easy variations of the texts read, and this, in conjunction with the English sentences given in the grammar, will insure an abundance of drill in this respect.

2. The work of the *second year* should include the reading of a minimum of 350 pages of modern prose, including a number of short dramatic works, with constant practice as before in retranslation of variants of the texts read. The drill in pronunciation and the writing of French from dictation should be continued. The grammar work should include a careful review of the ground covered in the *first year*, with drill upon all irregular verbs that are not very rare, the uses of the subjunctive, and a more detailed study of the syntax. There should be constant practice in the construction of sentences. Students should be required to give either orally

or in writing abstracts of portions of the texts read. Any of the following texts, recommended by the Committee of Twelve of the Modern Language Association of America, are suitable for the second year: About's *Le Roi des Montagnes;* Bruno's *Le Tour de la France;* Daudet's easier short tales; La Bédollière's *La Mère Michel et Son Chat;* Erckmann-Chatrian's stories; Foa's *Contes Biographiques* and *Le Petit Robinson de Paris;* Foncin's *Le Pays de France;* Labiche and Martin's *La Poudre aux Yeux* and *Le Voyage de M. Perrichon;* Legouvé and Labiche's *La Cigale chez les Fourmis;* Malot's *Sans Famille;* Mairet's *La Tâche du petit Pierre;* Mérimée's *Colomba;* extracts from Michelet; Sarcey's *Le Siège de Paris;* Verne's stories.

3. The work of the *third year* should include the reading of from 600 to 1000 pages of French, with constant practice in paraphrasing and abstracting portions of the texts *in French* The drill in pronunciation and in the writing of French from dictation should be continued unremittingly. A good grammar should be studied carefully. Students should be drilled in writing simple original themes in French. The texts recommended by the Committee of Twelve are as follows: About's stories; Augier and Sandeau's *Le Gendre de M. Poirier;* Béranger's poems; Corneille's *Le Cid* and *Horace;* Coppée's poems; Daudet's *La Belle-Nivernaise;* La Brète's *Mon Oncle et Mon Curé;* Madame de Sévigné's letters; Hugo's *Hernani* and *La Chute;* Labiche's plays; Loti's *Pêcheur d'Islande;* Mignet's historical writings; Molière's *L'Avare* and *Le Bourgeois Gentilhomme;* Racine's *Athalie, Andromaque*, and *Esther;* George Sand's plays and stories; Sandeau's *Mademoiselle de la Seiglière;* Scribe's plays; Thierry's *Récits des Temps Mérovingiens;* Thiers's *L'Expédition de Bonaparte en Egypte;* Vigny's *Canne de Jonc;* Voltaire's historical writings. It is recommended, however, that only sparing use be made of the classical plays, especially those of Corneille and Racine, which are more suitable for a fourth year.

For library equipment, see pages 106-108.

SPANISH.

THREE UNITS MAY BE OFFERED.

The work in Spanish should aim at a combination of the practical and the esthetic. Emphasis throughout the course should be laid on beauty of expression, the characteristic tone of Spanish literature, historical and literary references, on the one hand, and a sure grasp of grammatical principles, thorough drill in verbs, and independent expression, both oral and written, on the other.

First year. The instruction should above all be practical. Drill in variety should be the method, and thoroughness, not quantity, the object. Students, on finishing this course, should be able to read easy texts like Hills' *Spanish Tales for Beginners* (Holt), Valera's *El Pájaro Verde* (Ginn), and Carrión and Vital Aza's *Zaragüeta* (Silver, Burdett). From 150 to 200 pages of connected prose should be read. Drill in pronunciation and dictation might well occupy a portion of each period. Hills and Ford's *Grammar* (Heath) or Monsanto and Languellier's *Grammar* (Amer. Book Co.) is suggested. In the composition work, any ten of the grammar-sentences in each lesson should be sufficient.

Second year. A rapid review of the grammar, along with the writing of all the composition work, should be made. The reading of about 350 pages of modern prose, such as that of Galdós' *Marianela* (Heath), Valera's *El Comendador Mendoza* (Amer. Book Co.), Moratín's *El Sí de las Niñas* (Amer. Book Co.), is required. Some attention should be paid to literary qualities. Remy's *Spanish Composition* (Heath), or an equivalent, should be used both for composition and conversation. A Spanish newspaper or periodical would prove of interest and value to students.

Third year. Some of the more difficult masterpieces should be taken up, and considerable time devoted to their value as literature. Pupils should be referred to good histories of Spanish literature, such as Fitzmaurice-Kelly's or Ticknor's. Three or four works of the caliber and length of Galdós' *Doña Perfecta* (Heath), Núñez de Arce's *El Haz de Leña* (Heath), Ford's *Selections from Don Quijote* (Heath), and Calderón's *La Vida es Sueño* (Amer. Book Co.) should be read. Umphrey's *Spanish Prose Composition* (Amer. Book Co.) is suitably graded for this year. The ability to converse should be developed. For grammatical reference, Ramsey's unabridged *Text-Book of Modern Spanish* (Holt), and Bello y Cuervo, *Gramática de la Lengua Castellana* (A. Rogers), Paris, are suggested.

For library equipment, see page 108.

PHYSICS.

TWO UNITS MAY BE OFFERED.

The work consists of three closely related parts; namely, class work, lecture-demonstration work, and laboratory work.

The class work includes the study of at least one standard text. It should aim to build up in the pupil's mind clear concepts of physical terms and quantities, and an intuitive appreciation of the general principles which make up the syllabus given below. The pupil should be trained in the use of those principles in the solution of simple, practical, concrete numerical problems.

In the laboratory, the pupil should perform at least thirty individual experiments, and should keep a careful note book record of them. At least twenty of these should involve numerical work and the determination of such quantitative relations as may be expressed in whole numbers. Such quantitative work should aim to foster the habit of thinking quantitatively, but should not attempt to verify laws with minute accuracy nor to determine known physical constants with elaborate apparatus. The list of topics covered by these quantitative experiments ought not to differ widely from the list of starred topics in the syllabus.

The teacher is not expected to follow the order of topics in the syllabus, unless he wishes to do so. The list is not intended to include all the material for the year's work. It is purposely made short, in order that each teacher may be free to supplement it in a way that fits his individual environment. It does include those topics which all agree are essential to a first course in Physics, and which are capable of comprehension by boys and girls of high school age.

The syllabus of topics is as follows:

*1. Weight, center of gravity.
*2. Density.
*3. Parallelogram of forces.
4. Atmospheric pressure; barometer.
*5. Boyle's law.
6. Pressure due to gravity in liquids with a free surface; varying depth, density, and shape of vessel.
*7. Buoyancy; Archimedes' principle.
*8. Pascal's law; hydraulic press.
9. Work as force times distance, and its measurement in foot-pounds and gram-centimeters.
10. Energy measured by work.
*11. Law of machines: work obtained not greater than work put in; efficiency.
*12. Inclined plane.
*13. Pulleys, wheel and axle.
*14. Measurement of moments by the product of force times arm; levers.
15. Thermometers: Fahrenheit and Centigrade scales.
16. Heat quantity and its measurement in gram calories.
*17. Specific heat.

*18. Evaporation; heat of vaporization of water.
*19. Dew point; clouds and rain.
*20. Fusion and solidification; heat of fusion.
21. Heat transference by conduction and convection.
22. Heat transference by radiation.
23. Qualitative description of the transfer of energy by waves.
24. Wave length and period of waves.
25. Sound originates at a vibrating body and is transmitted by waves in air.
*26. Pitch and period of sound.
*27. Relation between the wave length of a tone and the length of a string or organ pipe.
*28. Resonance.
29. Beats.
30. Rectilinear propagation of light; pin-hole camera.
*31. Reflection and its laws; image in a plane mirror.
*32. Refraction, and its use in lenses; the eye, the camera.
*33. Prisms and dispersion.
34. Velocity of light.
35. Magnetic attractions and repulsions.
*36. Field of force about a magnet.
37. The earth a magnet; compass.
38. Electricity by friction.
39. Conductors and insulators.
*40. Simple galvanic cell.
*41. Electrolysis; definition of the ampere.
*42. Heating effects; resistence; definition of the ohm.
*43. Ohm's law; definition of the volt.
*44. Magnetic field about a current; electromagnets.
*45. Electromagnetic induction.
*46. Simple alternating current dynamo of one loop.
*47. Electromagnetic induction by breaking a circuit; primary and secondary.
48. Conservation of energy.

The notebook should be a concise record of what the pupil has done. The data should be so tabulated that any one familiar with the subject, or the pupil himself some months later, will be able to understand just what was done. It should be neat, clear and accurate, but the notebook is not the object of the course and too much time should not be put on it.

The text-book should be equal in grade to one of the following: Adams, American Book Co.; Carhart & Chute, Allyn & Bacon; Coleman, D. C. Heath & Co.; Hoadley, American Book Co.; Mann and

Twiss, Scott, Foresman & Co.; Millikan and Gale, Ginn & Co.; Mumper, American Book Co.

For the laboratory it is advisable to use a laboratory manual separate from the text-book. There are now a number of excellent manuals published. The use of one of these will in general be much more satisfactory than notes which must be copied by the pupils. The following manuals are suggested: Adams, American Book Co.; Ayres, Appleton & Co.; Crew and Tatnall, Macmillan; Coleman, American Book Co.; Hoadley, American Book Co.; Nichols, Smith and Turton, Ginn & Co.; Millikan and Gale, Ginn & Co.; Twiss, Scott Foresman & Co.

A second unit may be given, consisting of a continuation of the laboratory work for another year, or a year's work in a more advanced text together with laboratory work.

For laboratory equipment, see pages 47-52.

For library equipment, see pages 108-109.

CHEMISTRY.

TWO UNITS MAY BE OFFERED.

The course should consist of a year's work as outlined in a standard text-book of high school grade. It should consist of two closely related parts; namely, recitations including demonstrations by the teacher, and laboratory work.

Each pupil should be provided with an outfit of apparatus for the laboratory exercises, which should be largely carried out by the pupils working independently. A limited number of experiments, however, may be conducted by two pupils working together. Each pupil should record in a note book what he observes, and should do so at the time the observations are made. The interpretation of observed results and calculations may be recorded in the note book later, if the teacher so prefers.

As Chemistry is an art as well as a science, stress should be laid on handling and setting up apparatus in a neat and orderly manner. In the use of reagents, thought should be given to proportions, and the wasting of materials should be prevented. In experimentation, careful planning and skill of the hand should be emphasized. In this way the laboratory work becomes an interacting process of thinking, doing, and thinking. The pupil, for example, should know why an apparatus should be air tight and how to make it air tight; why gases are washed and dried, and how this operation must be done.

The text and reference books, as a rule, furnish an adequate and systematic account of the chemical changes selected for study, but the equally important feature of the course, the art of Chemistry, is imparted directly by the teacher.

In both laboratory and class work, the materials chosen for study should be restricted to a relatively small number of elements and their chief compounds. Interest in the work may be increased by applications of the facts and generalizations of the text to familiar phenomena in daily life. Visits should be made to the gas works, ice plant, lime kiln, and other chemical industries in the locality. The more important discoveries of Chemistry should become associated with the great masters of the science by anecdote, personal characteristics, or contemporary events.

A second unit may be given, consisting of more advanced work in the subject, during the same length of time as required for the first unit.

For laboratory equipment, see pages 52-54.

For library equipment, see page 110.

GENERAL BIOLOGY.

ONE UNIT MAY BE OFFERED.

This course should be designed to present a general survey of biological science, including the life processes, the activities, the adaptations, as well as the structure of organisms, treated from the standpoint of their general relations. General Biology is the study of the fundamental properties of living things, as illustrated by a carefully selected series of both animal and plant forms.

The laboratory work guided by suitable directions, should precede text-book work on any subject, and the pupil should be required to make careful drawings and notes on all observations. Accurate observations and records of the normal activities of living animals and plants should be made whenever practicable, both in the laboratory and in the field. Simple experiments upon the behavior of animals are very valuable, and should be made if possible.

The following series of forms for study is suggested:

(1) Amoeba; (2) Paramoecium or Vorticella; (3) Haematococcus; (4) Yeast Plant; (5) Spirogyra; (6) Hydra; (7) Mucor or Penicillium; (8) Earthworm; (9) Crayfish; (10) Grasshopper; (11) Fern; (12) Fresh Water Mussel; (13) Seeds and Seedlings; (14) Flowering Plant; (15) Frog, with metamorphosis. Hunter's Elements of Biology is a good text for this work.

For laboratory equipment, see pages 54-57.

For library equipment, see pages 110-116.

BOTANY.

TWO UNITS MAY BE OFFERED.

The work presented for one unit should deal, for the most part, with the seed plants, and should consist of recitations, laboratory work and field studies. While the study of structure is essential, yet most emphasis should be placed on the activities of plants.

The following topics are suggested:

I. *General studies with seed plants.* (1) The parts of a mature plant—roots, stem, leaves, flower; (2) the functions of roots and their modifications; (3) the functions of stems and their modifications; (4) buds; (5) leaves and their work; (6) flowers, parts, functions, adaptations for pollination; (7) fruits, kinds, adaptations for dispersal, value to man; (8) seeds, structure, germination, etc.; (9) relation of plants to light, soil, water, atmosphere; (10) plant families, studies of common representatives of the important plant families, as the roses, legumes, grasses, lilies, composites, etc. Forests and forest trees may well be considered here.

II. *Studies with lower plants.* These should deal almost entirely with gross structures, life habits and economic importance. (1) Algae, general appearance, abundance, local distribution, and relation to water supplies; (2) bacteria, relation to decay, to soils, to disease in plants and animals, to purity of milk and water supplies, to public hygiene; (3) molds, appearance, occurrence, importance in relation to food products; (4) yeasts and fermentation; (5) rusts, smuts, etc., as the cause of plant diseases, parasitic method of living, control of plant diseases; (6) mushrooms, edible and poisonous, cultivation, agents in destruction of timber; (7) liverwort, habits, distribution and life cycle; (8) moss, habits, distribution and life cycle; (9) fern, life cycle, distribution, local types.

Careful drawings, notes and deductions should be made. The student should make his own studies first and then read his text.

This outline is not intended as an essential arrangement, for the latter is best determined by convenience. Any arrangement, however, should enlist the interest of the pupil in the living plant—the plant in action—and laboratory studies should be made to bear this out. It is better, also, to omit some of the topics suggested than to treat them inadequately. The teacher must determine the apportionment of time, and bring out the connection of the topics.

The second unit should cover essentially the same ground as is taken up in Coulter's *Plant Structures*, or Bergen and Davis, *Principles of Botany*, Part II, dealing with the morphology, evolution and classification of plants. A careful laboratory study of types of the great groups of plants should be made. The forms selected should be considered largely from the standpoint of evolution.

For laboratory equipment, see pages 54-57.

For library equipment, see pages 110-116.

ZOOLOGY.

TWO UNITS MAY BE OFFERED.

The study of each form should include a consideration of the following: (1) habitat; (2) geographical distribution; (3) food; (4) adaptations to environment, including relations to other forms of animal and plant life; (5) general activities; (6) economic relations; (7) life history, and (8) structure.

In Zoology the same methods of instruction should be followed as are outlined above under General Biology.

The following series of forms for study is suggested:

(1) Protozoa (Amoeba, and Paramoecium or Vorticella); (2) A Coelenterate (Hydra); (3) An Echinoderm (Starfish or Sea-Urchin); (4) An Annelid Worm (Earthworm); (5) A Parasitic Worm (Cestode or Trematode); (6) A Decapod Crustacean (Crayfish); (7) An Orthopterous Insect (Grasshopper, and comparison with other Orthoptera); (8) A Coleopterous Insect; (9) A Lepidopterous Insect, with *larva* and *pupa;* (10) A Hymenopterous Insect; (11) A Pelecypod Mollusc (Fresh-water Mussel); (12) An Amphibian (Frog, with metamorphosis).

For high schools equipped to do thoroughly satisfactory work in Zoology, text-books, such as the following, are recommended: Jordan, Kellogg, and Heath's *Animal Studies*, accompanied by Jordan and Price's *Animal Structures* as a laboratory guide.

A book such as French's *Animal Activities* is recommended for schools that are not prepared to offer as extensive a course in Zoology as the above text-books presuppose.

A second unit may be given, consisting of more advanced work in the subject, with a study of additional forms, during the same length of time as required for the first unit. For a second unit, Linville and Kelly's *A Text-book in General Zoology* is recommended.

For laboratory equipment, see pages 54-57.

For library equipment, see pages 110-111 *and* 113-116.

PHYSIOLOGY.

ONE UNIT MAY BE OFFERED.

Physiology should be preceded by a course in General Biology or by a course either in Zoology or in Botany. At least two double periods a week should be given to laboratory demonstrations by the instructor and to dissections and physiological experiments performed by the student, always under careful supervision. In a high school Physiology course, a certain amount of time should be given to the anatomical study of structures which are to be used later for physiological experiment and demonstration; but the structure should be studied only for the sake of a better understanding of the function. Careful notes and drawings of the structures dissected should be preserved for use as guides in making physiological preparations. Full notes should also be taken in connection with all required physiological demonstrations, and these notes should indicate the observations made directly on the living tissues and organs, and should show the results of the study of mechanical records of experiments on the living organs and tissues, such as muscular contractions, nerve irritability, blood pressure, the heart beat, capillary circulation, respiratory movements, etc.

In the study of digestion, secretion, blood clotting and in the study of composition of the tissues, the elementary phases of physiological chemistry should be presented. Laboratory notes, the original notes taken at the time of the experiments, are to be required.

The text-books and printed guides are numerous and a judicious amount of selection and elimination is necessary. Of the better high school texts may be mentioned, Martin's *Human Body*, revised edition; Huxley's *Lessons in Elementary Physiology*, revised edition; Schenck and Güber's *Human Physiology*, translated by Zoethout; Hewe's *High School Physiology*, which has directions and suggestions for laboratory experiments; Hough and Sedgwick's, *The Human Mechanism;* Walter's *Physiology* and *Hygiene*

For laboratory equipment, see pages 57-59.

For library equipment, see pages 116-117.

PHYSICAL GEOGRAPHY.

ONE UNIT MAY BE OFFERED.

The following outline includes only the more essential facts and principles of a unit course. For a fuller definition, see University Bulletin entitled *A Unit in Physical Geography*, by Joseph D. Elliff and Curtis Fletcher Marbut. A copy of this bulletin may be secured free by writing to the Mailing Clerk, University of Missouri, Columbia, Missouri.

Mathematical Geography. 1. Review of subject as presented in grammar school geography, including construction of diagrams to show inclination of the earth's axis to the plane of its orbit, perihelion and aphelion. position of equinox and solstice. Measurement of sun's altitude by means of sun board. Determination of latitude by measuring altitude of pole star.

2. The earth considered as a planet. Rotation, proofs, results. Revolution, proofs, results. Magnetism, compass, poles, variation.

The Atmosphere 1. Composition, extent and offices of the atmosphere.

2. Temperature, source of temperature, variation of temperature, isotherms, isothermal charts of the world for January and July.

3. Pressure, measurements of pressure, relation of pressure to temperature, study of isobars on United States weather map, distribution of pressure, relation of isobars to isotherms.

4. Atmospheric moisture, source, amount, how measured.

5. Atmospheric movements, winds, classes, direction, cause. Special study of character and paths of storms in the United States.

6. Weather and climate, use of weather maps.

The Land. 1. Earth materials. A study of the common rocks and rock forming minerals. A more detailed study of the rocks and soils of the locality.

2. Land forms. Before beginning the study of land forms as presented in the text, the student must be taught to use the Geological Survey Maps. With the use of Geological Survey Maps to illustrate each type of topography, the following should be studied: (a) Plains, simple plain, a plain with valleys, a plain with hills, a plain with hills and valleys. (b) Plateaus, simple plateau, plateau with valleys, plateau with hills, a plateau with hills and valleys. (c) Mountains, a simple mountain, a mountain with valleys.

3. Weathering. Conditions affecting weathering, weathering agents, transportation of material, results of weathering.

4. Special study of the valley. Birth of valley, how it grows, how it gets a stream, limits of growth, accidents that may happen to valleys.

5. Ground water, source, amount, use.

6. The work of streams.

7. Work of ice. Lake ice, river ice, seashore ice, snow line, snow fields, local and permanent. Formation of glacial ice, glacial movements, types of glaciers, work of glaciers, icebergs.

8. The ancient ice sheet, evidence of its existence, how it developed, extent, center of dispersion, unglaciated areas, changes produced by erosion and deposition of material. Characteristics of glaciated areas of United States.

Volcanoes and Volcanic Phenomena. General facts, kind and distribution. Study of cone, dyke, crater, fissure, lava.

The Ocean. 1. Form, divisions and general characteristics of the ocean.

2. Depth, density, temperature and composition of ocean waters.

3. Characteristics of ocean floor.

4. Distribution of life in ocean.

5. Movements of ocean water. Waves, cause and effect. Currents, causes and effects. More important currents. Tides, character, cause.

6. Special study of shore lines.

The Earth and Man. Relation of man, plants and animals to climate, land forms and ocean areas.

For laboratory equipment, see pages 59-63.

For library equipment, see page 118.

AGRICULTURE.

ONE UNIT MAY BE OFFERED.

The work should consist of two parts, (1) individual laboratory and field work and (2) recitations based upon the laboratory work, the text-book and assigned readings. Three periods a week should be given to the recitations and two double periods a week to laboratory and field work. As a rule, the laboratory work should precede rather than follow the recitation. Every school should have a small plat of ground, a half acre or more, for a school farm and garden. It is not essential that the topics be studied in the order given below. It is essential, however, that the study of soils precede the study of plants, and that the problems of farm management come last.

No special list of experiments is required. Each teacher should prepare a list of at least sixty experiments. Practically every topic in the outline may be made the basis of a profitable laboratory or field exercise. The outline here given is an abbreviated statement of the one in the University Bulletin entitled *A Unit in Agriculture* by Joseph Dolliver Elliff. This circular, *A Unit in Agriculture*, contains suggestions concerning the course of study, method of teaching and equipment of laboratories and libraries for teaching Agriculture in Accredited Schools. It may be obtained free by addressing the Mailing Clerk, University of Missouri, Columbia, Missouri. Part II of this circular is also published separately as a pupils' laboratory manual in Agriculture, and copies of it may be secured free by writing to the Secretary of the Committee on Accredited Schools, University of Missouri, Columbia, Missouri.

The outline is as follows:

Farm Crops.—Corn, wheat, oats, the legumes, the grasses, potatoes, and other crops of importance grown in the vicinity of the school.

The following topics for the study of corn will suggest the kind and amount of work to be done in the study of any crop: (1) A grain of corn, an ear of corn, a complete plant; (2) the three types and six principal varieties of corn; (3) corn judging, use of score card; (4) how to select, store and test seed corn; (5) methods of cultivation, preparation of soil, planting, cultivating and harvesting; (6) insect enemies of corn and how to fight them; (7) corn, corn products, importance, value and use.

The Soil.—(1) Origin, formation, composition and kinds of soil; (2) soil water, soil air, soil temperature, soil drainage; (3) meaning and method of tilling the soil.

Plant Propagation.—(1) Propagation by seeds; (2) propagation other than by seeds.

Plant Growth.—(1) Conditions of plant growth; (2) principal elements of plant food—soil-derived and air-derived.

Enemies of Plants.—(1) Insects—biting insects, sucking insects; (2) diseases caused by certain bacteria as fire blight; (3) fungus diseases; (4) spraying to control insects and diseases.

Animal Husbandry.—(1) Origin, brief history, principal types and breeds of horses, cattle, sheep, swine, poultry; (2) live stock judging, use of score card.

Feeding.—(1) Composition of foods, function of each constituent; (2) the balanced ration.

Farm Management.—(1) Choice of farm; (2) the farm house; (3) other farm buildings; (4) maintenance of soil fertility; (5) improvement of farm animals.

Additional Topics for Special Study.—(These may be selected according to the dominant interests of the community.) (1) Any farm crops, as apples, peaches, strawberries, cotton, tobacco; (2) dairying; (3) fertilizers; (4) farm implements.

For laboratory equipment, see pages 63-65.

For library equipment, see pages 118-119.

MUSIC.

ONE UNIT MAY BE OFFERED.

In the unit's work in Music, the pupils should acquire the ability to do the following:

1. To sing a selection in the key and time in which it is written, after having had the pitch "C" given to them. Either the "movable do" or "fixed do" methods may be used or better still the syllable "la" as disassociated from either. In the matter of difficulty, the selection should be on a par with songs found in books suitable for High School Choral practice, such as Hoff's *Corona Song Book*, Ripley and Tapper's *Advanced Music Reader* (The Natural Course), Smith's *Fourth Book* (The Modern Music Series), Tomlin's *Laurel Song Book*.

2. To name and qualify (perfect, major, minor, augmented, diminished) intervals struck on the piano, both in succession and combination, by other persons. The pupils should not see the keys as they are struck, but should recognize the intervals by ear. The tests as given under 1 and 2 are for the purpose of a clear recognition of tones and their symbols.

3. To write the chords to figured basses, implying a knowledge of the primary and secondary triads in major and minor and their inversions and of the chord of the dominant seventh with its inversions and resolutions. This work is covered in the first 77 pages of Jadassohn's *A Manual of Harmony*.

If the pupils have not had music in the grades, proficiency in sight reading may be acquired by the use of such books as the following:

The Modern Music Series—(Primer, First Book, Second Book, Third Book), Silver, Burdett.

Educational Music Course—(First Reader, Second and Third Readers; Fourth and Fifth Readers), Ginn.

Natural Music Course—(Primer, First Reader, Second Reader, Third Reader), American Book Co.

For continuing Music in the High Schools, such books as the following will be found serviceable:

The Laurel Song Book, (Boston), C. C. Birchard; *The Corona Song Book*, Ginn; *Songs of the Nation*, Silver, Burdett; *Standard Songs and Choruses*, American Book Co.; *The Modern Music Series*—Fourth Book, Silver, Burdett; *Art Songs for High Schools*, American Book Co.

While sight-reading necessarily implies ear-training, special attention may be given to the latter subject by the use of such a book as Heacox's *Ear-Training*, (Philadelphia), Presser.

It is suggested that the work in harmony be based on such a book as Jadassohn's *A Manual of Harmony*, (New York), Schirmer.

DRAWING.

TWO UNITS MAY BE OFFERED.

The following outline, recently adopted by the North Central Association of Colleges and Secondary Schools, indicates the nature of the work which should be included in the two units of Drawing. While the work is not separated here into a *first* and *second year* program, the more elementary forms of each phase of the subject should be selected for the *first year*. Approximately one-third the time should be given to representative drawing and two-thirds to decorative composition, constructive and decorative design, construction and applied design.

1. Pictorial.—Plant study (flowers, sprays of leaves, seeds, pods, etc.). Object study. Landscape (roof studies, buildings, etc.). Pose drawing. Composition.

2. Decorative Composition.—Plant forms, object study, landscape, post.

3. Decorative Design.—Plant analysis (for the purpose of design). Conventionalized plant forms. Decorative units, borders, surfaces, corners, rosettes, posters, book-covers, etc. Stencils, wood-block printing. Historic ornament. Arrangement of straight lines, and of straight and curved lines. Geometric design. Lettering, illuminating. Schemes for interior decoration.

4. Constructive Design.—Designs for pottery, leather, metal, book-binding, furniture, cardboard construction, textiles, etc.

5. Crafts.—Pottery, leather work, metal work, book-binding, furniture. (Choice of one or more of the above crafts.)

6. Applied Design.—Design applied to the crafts and to cardboard, textiles, etc.

7. Illustration.

8. Talks on history and industry of art, on civic planning, domestic architecture and decoration.

9. Instrumental drawing to be given as needed to meet the requirements of practical designing and construction.

NOTE.—Mediums used: pencil, charcoal, water colors, crayons, brush and India ink, and a combination of the pure mediums.

It is desirable to accentuate the life interest in these subjects as well as the technical achievement. Taught from the standpoint of their social interest, these topics may be made of great benefit in the adjustment of the student to social life. For example, in constructive design the problem of the house could be studied from the view-points of convenience, suitability, cost, appearance, etc. Under decorative design, schemes for the interior decoration of one or more rooms in the individual pupil's house (as planned above) could be worked out. This idea might be extended to embrace business houses, factories, etc. The pictorial composition could deal largely with the industrial occupations of man, with sketch and pose work made tributary to this end. Complete expression is to be sought; and, whenever possible, the problem should be approached from the side of its relation to the life of the student.

For library equipment, see pages 120-121.

MANUAL TRAINING.

TWO UNITS MAY BE OFFERED.

1. *A Unit in Woodworking.*

In the following outline of a one year course in woodworking, the work has been arranged in groups. Each group contains a number of problems involving the same process. The arrangement provides for the uneven progress of the class, and the teacher is able to keep all members of the class engaged on the same type of work, although working on different objects. A number of supplementary exercises should be provided. The student may be permitted to make almost any object which involves the processes or principles of the group in which the class is working.

The subject-matter is indicated under the heading "Processes."

Group I. Giving the first use of the saw and the laying-out tools, such as the gage, trysquare and rule.

Processes: Measuring, squaring, gaging, sawing, boring, making dowel.

Problem: Game board, counting board, laundry list, puzzle, etc.

Group II. Emphasizing the first use of the plane.

Processes: Planing (1) surface, (2) edge, (3) to dimensions, (4) chamfering.

Problem: Swing-board, hat-rack, bread-cutting board, etc.

Group III. Teaching the first use of the chisel.

Processes: Vertical chiseling, gouging, paring, sharpening chisel.

Problem: Shelf and brush-rack, tray, sleeve-board, etc.

Group IV. Involving "form-work" and the first use of the spokeshave.

Processes: Bow-sawing, modeling, sand papering.

Problem: Coat hanger, tool handle, canoe paddle, etc.

Group V. The construction of objects by means of some form of the groove joint.

Processes: Housing, halving, nailing, carving, finishing.

Problem: Waterwheel, test-tube rack, book-rack, flower-pot stand, loom, sled, box-trap, bracket-shelf, knife-polishing board, towel roller, etc.

Group VI. More exact work in planing in order to make a glue joint.

Processes: Planing joints, gluing, clamping.

Problem: Bread-moulding board, drawing board, bench-hook, etc.

Group VII. Construction by means of the mortise-and-tenon joint.

Processes: Laying out duplicate pieces, cutting a mortise, sawing tenon, finishing.

Problem: Stool, plant-stand, taboret, umbrella rack, table, etc.

Group VIII. Construction involving the mitre joint.

Processes: Planing parallel edges and sides, use of mitre-box, laying out brace.

Problem: Mitre-box, framing a picture, box, bracket, etc.

Group IX. Elementary cabinet making involving the use of panel.

Processes: Plowing, fitting, putting on hinges.

Problem: Sewing cabinet, music cabinet, plate-rack, screen, bookcase, etc.

In taking the course outlined, the student should learn the following:

(a) With reference to *tools*.

1. To use the rule in measuring and dividing spaces.
2. How and when to use knife and pencil in laying out work.
3. To use dividers or compasses to draw arcs or divide spaces.
4. To use try-square to lay out work and to test work.
5. To use, adjust and sharpen jack plane and block plane.

6. When and how to use cross-cutting saw, rip saw and back saw. Should know the distinguishing characteristics of these saws and the reasons for these differences.
7. To use and sharpen chisels.
8. To use hammer and nail set.
9. To use screw driver and countersink for setting screws.
10 To use brace and bit—How sizes of bits are designated.
11. How and when to use spoke-shave, file and sand-paper,
12. To use gouge.
13. To name all of the tools used.

(b) With reference to *processes.*

1. To make, mark and use a working corner.
2. To take proper steps in making a board a given length, width and thickness.
3. To detect direction of grain and use this knowledge.
4. To lay out and bore a hole through a board. How to bore to depth.
5. To plane a surface true.
6. To lay out and make a chamfered corner.
7 To lay out and make a rounded corner.
8. To make a "butt" joint.
9. To lay out and make properly a housed or dado joint.
10. To lay out and make properly a cross-lap joint.
11. To lay out and make properly a "mortise and tenon" joint.
12. To make a glue joint.
13. To lay out and make miter joint.
14. To construct a panel.
15. To apply simple finishes.

2. *A Unit in Mechanical Drawing.*

The outline of a unit in Mechanical Drawing is given below. In all pencil drawing with instruments, great care should be taken to make sharp lines with accurate intersections. Do not delay precision till ink is used.

In the first half year such as the following should be studied:

(a) Straight lines; use of T-square, triangles, pencil, ruling pen, dividers, and scale. Conventional lines. Freehand working sketches.

(b) Circles. Use of compasses, center lines, cross hatching.

(c) Tangents. Location of centers and points of tangency.

(d) Planes of projection; elementary principles of projection. Projections of simple geometric figures.

(e) Revolution of objects. "Views" of objects in simple and inclined positions.

(f) Developments: prism, cylinder, pyramid, cone.

In the second half year such as the following should be studied:

(a) Intersections. Axes in the same plane, axes in different planes.

(b) Isometric and cabinet drawing.

(c) Freehand and mechanical lettering; placing, form, slant, spacing, stroke.

(d) Working drawings; furniture.

(e) Working drawings; machine parts.

For laboratory equipment, see pages 65-69.

For library equipment, see pages 121-122.

DOMESTIC SCIENCE AND ART.

TWO UNITS MAY BE OFFERED.

One unit may be offered, composed of the most important portions of the two units given below, or each of the units mentioned below may be offered individually.

A unit in cooking. This should consist of a practical application of the principle of cooking, designed to teach modern and efficient methods, with scientific explanation sufficient to make the principles rational rather than mechanical. This may include the study of the effects of heat upon foods; experiments with leavening agents; bread making; canning and preserving fruits, vegetables and meats; planning, cooking, and serving meals; waiting on table; cost and market prices of foods, and cost of meals; the family dietary and diet for invalids, convalescents and infants.

A unit in sewing. This should consist of practical sewing, dealing essentially with the choosing and making of simple garments, by hand or on the sewing machine, with enough exercises in technique to make the sewing efficient. The course may include the estimation of cost and durability in selection of materials; advantages of various weaves and fibres; detection of adulterations in the common varieties of cloth; the care of clothing, mending and cleaning; draughting, cutting and making; the use and care of sewing machines; the fundamental processes of hand sewing; and the various stitches, and their special uses.

For laboratory equipment, see pages 69-72.

For library equipment, see pages 122-123.

ECONOMICS.

ONE-HALF UNIT MAY BE OFFERED.

The course in Economics should not be given earlier than the fourth year in the high school. The subject-matter should include the leading facts and principles of economics, such as division of labor, the factors of production, the laws of diminishing returns, demand and supply, value and price, wages, interest, rent and profit, credit, taxation, regulation of monopolies, and international trade. One of the better grade of texts in current use such as those by Bullock, Clark, Davenport, Ely and Wicker, Johnson, Laughlin, Walker, etc., will serve as a basis for the work, but should be supplemented with discussion and practical exercises. Written exercises are desirable.

For library equipment, see page 123.

COMMERCIAL GEOGRAPHY.

ONE-HALF UNIT MAY BE OFFERED.

The object of this course is to discover the causes of the present territorial distribution of industries and of the location of lines of communication and transportation. It should treat in detail with reference to the United States, and in less detail with reference to the outlying possessions of the United States and to the most important commercial countries, the following topics: (1) the effect of surface, soil, climate, etc., that is, the physical factor in commerce; (2) the influence of race, religion, education, commercial policies, etc., that is, the human factor in commerce; (3) the effect of economic forces on production and commerce; (4) means of transportation and communication. The text-book should be supplemented by map work and assigned readings. The census of manufactures in the United States and other countries would form a valuable reference library, both for the purpose of map work and assigned readings.

It is desirable that for purposes of illustration, samples of commercial staples, lantern slides, stereopticon pictures, etc., should be freely employed; and wherever possible, that visits of inspection be made and informal lectures secured by experts in various industries. Commercial Geography should be preceded by Physical Geography, in case both are given.

For library equipment, see page 123.

BOOKKEEPING.

ONE UNIT MAY BE OFFERED.

The student should become familiar with the meaning of double entry terms, with rules for debit and credit, and the kinds and uses of books. He should acquire the ability to keep a single entry and a double entry set of books. Furthermore, he should become familiar with such standard business forms as bills, receipts, checks, notes, time and sight drafts, endorsements, invoices, accounts sales, deposit tickets, express receipts, bills of lading, statements of account, balance sheets, etc. He should become familiar also with the forms of business letters, beginnings and endings, etc., and should know how to write and answer telegrams and advertisements.

Bookkeeping should be done largely under the eye of the teacher as laboratory work. Good penmanship, neatness in work, accuracy and speed must all be acquired in such laboratory practice. The exercises in some of the texts which are offered by the various publishers on first lessons or elementary principles would naturally form the basis for much of such work, unless the teacher prepares his own exercise work according to a similar plan. The best evidence of good work in this subject is the character of exercise work which the student can present as a result of his laboratory practice.

Some of the best reference works, useful especially to the teacher in charge of elementary work, are Sprague's *Philosophy of Accounts*. Hatfield's *Modern Accounting*, Lisle's *Accounting in Theory and Practice*. Dicksee's *Bookkeeping for Accounting Students*, and Cole's *Accounts—Their Construction and Interpretation*.

II.

SUGGESTIONS FOR THE EQUIPMENT OF LABORATORIES.

GENERAL INFORMATION.

The laboratories of a high school should be on the north side of the building, and the length of the room from east to west should be made much greater than the breadth from north to south. It is an object to have as much north light as possible. This is especially true of Biological work. It is, however, not so necessary for Physics and Chemistry. In the work in Physics, sunlight may often be used to advantage and it is well to have one or two windows exposed to the sun. All laboratory rooms should be supplied with gas and water.

In the construction of a new building that is to contain a laboratory, it is important to remember that the windows should be high, running up to the ceiling; that the rooms should not be so deep from the windows on the north to the opposite wall on the south as to render it difficult for light to get readily across, and that the distance from the top of the window sills to the floor should be the same as the height of the laboratory tables. In horizontal measurement, the windows and intervening spaces of brick or stone should be about equal in width. Therefore, in horizontal measurement the north front of a laboratory should be nearly half glass. Too great care cannot be exercised to secure perfect ventilation. The temperature should be kept uniform.

The class room for the recitations in either Physics or Chemistry should be near the laboratory so that apparatus may be readily transferred to and fro. This room should have a demonstration table at least eight feet long, with both water and gas connections. If electrical power is available, this room should be wired for a lantern. Even if no lantern is available, the room should be curtained with opaque enameled cloth shades so that it can be darkened. In Missouri climate there are enough clear days to warrant special attempts to use sunlight in the class room work in Physics. One of the best arrangements is to place the demonstration table with its end toward a south window. Sunlight can then be thrown the length of the table by a mirror (heliostat) placed in the window.

But good rooms and equipment amount to little without good teachers, and the best teachers cannot do good work if opportunity be denied. Every high school in the State should have at least one person who does nothing but instruct by the laboratory method, and the larger schools should have two or more such teachers.

It is not possible for one person to meet as many classes a day in the laboratory as in the recitation room. If the quota of work for each teacher is seven recitations a day, the teacher of science should not be expected to have more than four. Careful preparation for each laboratory exercise is indispensable. In the recitation work in Physics, it is essential that carefully planned demonstration experiments be given. These will require considerable time in preparation, but it is time well spent. Few things in a class room are more pleasing and more instructive than a well executed successful experiment, and few things are more disastrous than the failure of a demonstration.

It is not economy to buy too cheap apparatus. It is always best before purchasing to submit lists to the various apparatus companies for bids.

PHYSICS.

As indicated in the definition of the unit, no special list of experiments is required, each teacher being given considerable latitude in the choice of experiments. Each school should offer about fifty experiments, not attempting to make all the pupils perform the same experiments. Experiments for any particular pupil should be to some extent chosen to meet the individual needs of that pupil. In counting the required thirty experiments, the "preliminary" experiments that appear in some lists must not be included, such experiments as measurements of lengths in centimeters and inches, measurements of areas and experiments designed solely to acquaint the pupil with the fundamental units and their measurement. Each experiment should be planned to illustrate some fundamental principle of Physics and this principle should be clearly brought out.

In equipping the laboratory, it is first necessary for the teacher to choose the laboratory manual and the list of experiments to be offered. When that is done, apparatus to fit that manual and that list can be selected. Apparatus purchased from a list prepared in any other way, will be unsatisfactory, and, in all probability, will not fit the work. The experiments as given in laboratory manuals are usually planned so as to obtain the maximum use of each piece of apparatus, thus reducing the number of pieces necessary to buy. To obtain benefit of this, the apparatus must be selected to fit this plan. If several different experiments are conducted at the same time, not only is the work of the individual pupil more independent, but needless duplication of apparatus is avoided. Thus a greater variety and better grade of apparatus is rendered available.

It is impracticable to make partial lists that are satisfactory. If only a small amount of money is available for apparatus it is best to buy an equipment covering definite portions of the subject as, for example, mechanics, heat and sound, which is fairly complete as far as it goes. Future additions are not only more likely to be obtained but can be selected more wisely. Under the instruction of the teacher, some of the necessary apparatus can be made at home. Many things can be picked up here and there that are very useful in the laboratory. For example, small scraps of different metals are useful for density or specific heat determinations. Often scrap iron that costs but little can be used in place of the more expensive large iron weights.

The following list is appended merely to give an idea of the cost of apparatus. *This list must be changed to suit the manual and the experiments given in the course.*

LABORATORY EQUIPMENT FOR TWELVE STUDENTS WORKING AT THE SAME TIME.

MECHANICS AND PROPERTIES OF MATTER.

6	30 cm. rulers	$ .18
6	Meter rods	1.60
½ ℔	Annealed iron wire, No. 24, B. & S. Gauge, on spool	.28
¼ ℔	Spring brass wire, No. 27, B. & S. Gauge, on spool	.30
¼ ℔	Spring brass wire, No. 24, B. & S. Gauge, on spool	.25
½ ℔	Bare copper wire, No. 32, B. & S. Gauge	.40
4	8 oz. spring balances, graduated in both English and metric units with flat backs, broad pointers	3.60
4	64 oz spring balances, graduated in both English and metric units with flat back, broad pointers	2.00
6	White pine rods, straight grained, 41x½x½″	.43
6	White pine rods, straight grained, 41x1x½″	.54
2	Sets iron weights, 1000 grams to 5 grams	3.60
4	Mounted upwrights 10 cm. scales, divided in mm.	.59
12	Hardwood prisms	.54
1	Each steel bicycle balls, ¼″ & ⅜″ dia.	.08
6	Pulleys, wooden, cone bearing	2.50
3	Sets rods for same	.27
1	Steel rule, 20 cm. long, graduated in mm. & in.	.90
1	Jolly balance, all metal	8.10
1	Torsion apparatus after model of Carmen, complete with rods	12.00
1	Micrometer-caliper, metric, 13 mm.	3.00

1	Vernier caliper, English and metric, inside and outside jaws, depth gauge	2.25
1	Spherometer reading to 1—100 mm.	3.50
1	"Cenco" balance complete (if a good beam balance is not available)	15.00
1	Metal cylinder, iron, about 50 mm. long, 12 mm. diam., for density determinations	.22
1	Metal cylinder, brass, about 50 mm. long, 12 mm. diam., for density determinations	.22
1	Metal cylinder, aluminum, about 50 mm. long, 12 mm. diam., for density determinations	.22
2	Smooth pine boards, 6x24″, for friction	.60
2	7″ hand screw clamps, No. 14	.60
3	Waterproof cherry blocks, 3x3x1½″	.42
2	Platform balances, Harvard trip agate bearing	12.00
2	Sets weights, 1000 to 10 grams	2.15
2	Sets weights, 0.01 to 1 gram	.90
5	Waterproof loaded rectangular blocks	1.00
1	℔ Sulphur rolls	.10
6	Lead sinkers	.70
5	Round waterproof rods, 8x½″	.30
4	Sp. Gr. bottles, 50 cc. approximately	1.60
4	Glass "J" shaped tubes, closed at one end for Boyle's Law	2.70
2	"Y" tubes of lead	.40
6	℔ mercury and bot.	6.00
12	Small glass tumblers	.54
12	Glass tubes, 50 cm. long, 5 mm. diam.	.40
6	Screw pinchcocks	1.20
6	Ft. rubber tubing, ¼″ diam.	.60
2	Bottles, 2 liters capacity with stoppers, rubber, 1-hole	.60
1	Condensing and exhausting pump (if better is not available)	3.60
2	℔ Paraffine	.30
1	Barometer tube, 80 cm. long, 5 mm. bore, closed at one end	.30
1	Nicholson's hydrometer	1.50
1	Jar for hydrometer, 12x2½	.45
2	Board for composition of forces	3.20
2	Cars for inclined plane	2.00
2	Pulleys for same	1.35
4	Iron balls, 25 mm. diam., for pendulum	.29
1	Pr. ivory balls, 50 grams and 150 grams	4.00
	Total for Mechanics and Properties of Matter	$112.37

HEAT.

6	Flasks, 125 cc.	$ .54
3	Air thermometer tubes, 2″ bulb	.46
12	Thermometers—10 to 110 c.	10.80
2	Liner expansion apparatus, all metal with N. P. brass tube	4.80
5	℔ Shot, No. 6	.70
8	Calorimeters, polished, N. P.	3.60
4	Harvard apparatus "A" new style, with detachable tripod	9.00
1	℔ Heavy walled glass tubing, 1 to 2 mm. internal diam.	.54
3	Iron supports, 2 rings each	.90
3	Sheets brass wire gauze, 4x4″	.27
100	Grams pure paraffine for melting point determination	.10
2	Nests beakers, No. 1 to 3	.84
4	Florence flasks, 12 oz.	.56
4	Florence flasks, 16 oz.	.72
4	Florence flasks, 8 oz.	.48
	Total for Heat	$ 34.31

SOUND.

1	Kundt's apparatus with brass and steel rod, improved form	$ 3.35
1	Sonometer with pulley for weights, 2 strings	5.00
2	Annealed glass resonance tubes, open at both ends about 2.5 cm. diam., 120 cm. long, with sliding rod and piston support	3.60
1	Tuning fork, C 128, 10″ long	2.70
2	Tuning forks, C 256, 7¼″ long	2.20
2	Tuning forks, A 426, 6¼″ long	2.20
2	Tuning forks, C 512, 5⅞″ long	1.80
	Total for Sound	$ 20.85

LIGHT.

1	Box to illustrate formation of images	$ .58
12	Plane mirrors, 4x15 cm. or 2x6″	1.20
10	Double convex lenses, 10 cm. focus	1.50
10	Double convex lenses, 15 cm. focus	.80
6	Lens supports	.90
6	Screen supports	.54
6	Pin supports	.54
6	Walter Smith school squares, med.	.38
1	Double convex lens, 7.5 cm. diam., 18 cm. focus	.90

3	Concave mirrors, brass, N. P.	1.35
3	Triangular glass prisms, 4″ long	.90
2	Pieces heavy plate glass for refraction	.50
4 ℔	Paraffine candles, twelves	.80
	Total for Light	$ 10.89

MAGNETISM AND ELECTRICITY.

1 ℔	fine iron filings	$ .15
25	Steel knitting needles	.18
10	Bar magnets, 6″ approximately	2.00
4	Compasses, 40 mm. diam., needle 3 cm. long	.90
3	Sq. Ft. Heavy zinc sheet, 1-16″ thick	1.53
1	Galvanoscope frame	1.35
12	Lead strips, 1x10 cm., with wire	1.20
4	Sq. Ft. Sheet copper, No. 24	2.70
10	Glass battery jars, 4x5″	1.80
6	Porous cups, 5x10 cm.	.80
4	Commutators	2.20
12	Double connectors, brass	1.20
¼ ℔	Copper wire, No. 30 D. C. C.	.57
1 ℔	Copper wire, No. 20, D. C. C.	.70
¼ ℔	German silver wire, No. 30, D. C. C.	1.15
¼ ℔	German silver wire, No. 24, D. C. C.	.75
9 ℔	Commercial sulphuric acid and GSB	.70
1	Slide wire Wheatstone bridge	3.00
1	Set of 8 resistance spools after Hall	3.00
6	Gravity cells, 6x8 complete	4.80
10 ℔	Copper sulphate	1.00
2	Resistance boxes, 0.1 to 40 ohms, guaranteed accurate to ½ of 1 per cent, wound with manganin wire	15.00
1	Tangent galvanometer	6.75
2	D'Arsonval galvanometers sensitive to 25 megohms with open coil, sight and scale attachment and leveling screws	12.00
10	Empty spools for making resistance coils	1.00
	Total for Magnetism and Electricity	$ 66.43
	Total for Entire Physics Equipment	244.85

Dealers in Physical Apparatus.

Central Scientific Co., 345 West Michigan St., Chicago; Chicago Apparatus Co., 40-42 West Quincy St., Chicago; Wm. Gaertner &

Co., 5347-9 Lake Ave., Chicago; T. W. Gleeson, 106 Sudbury St., Boston; A. W. Hall Scientific Co., 141 Franklin St., Boston; L. E. Knott & Co., 15-17 Harcourt St., Boston; C. H. Stoelting Co., 18 South Green St., Chicago. On demand, some of these firms furnish lists of apparatus to fit particular manuals. Many suggestions are also obtained by consulting their general catalogues.

CHEMISTRY.

A LABORATORY EQUIPMENT FOR TWENTY-FOUR PUPILS, TWELVE WORKING AT ONE TIME.

FIXTURES AND PERMANENT EQUIPMENT.

2	Tables, 12 feet long, 3 feet 6 inches broad, and 3 feet high, tops of white pine, remainder of yellow pine, oil finish. Each table has closet room for twelve and working space for six at one time	$ 50.00
1	Hood, 4 feet long, 2 feet deep and 9 feet high, with closet	24.00
1	Wall sink with sewer connection	12.00
	Gas and water pipes with fittings	7.00
1	Wall shelf for small bottles	2.00
15	2 liter stock bottles with glass stoppers	3.75
52	½ liter reagent bottles for tables	9.75
24	8 ounce glass stoppered bottles ("German tinctures") for side reagents	2.90
6	dozen 4 ounce wide mouthed flint glass bottles for solids (side regents)	2.90
6	Earthenware slop jars	1.00
1	6 inch mortar	.80
2	6 inch funnels	.50
	Total for fixtures	$115.70

APPARATUS MORE OR LESS PERMANENT.*

30 Nests of beakers, 2½, 4, and 7 ounces, plain Bohemian....
30 Blowpipes, jeweler's, 8 inch ....
6 dozen Flint glass, wide mouthed bottles, 4 ounce......
18 Flint glass, wide mouthed bottles, 16 ounce ....
24 Bunsen burners with air regulator ....
8 dozen Corks, 7-8 inch ....
4 dozen Corks, 1 1-16 inch ....
12 dozen Corks, assorted ....
18 Nests of Hessian crucibles, "threes" ....
4 dozen 1 1-4 inch porcelain crucibles ....

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*These items are not priced as there is considerable variation in prices. A dealer in laboratory supplies will submit an estimate.

24 50 cc. graduated cylinders
3 dozen German porcelain evaporating dishes, each 2 1-2 and 3 1-2 inch diameter
12 Lead dishes, 2 inch
24 Round files, 3 inch
24 Three cornered files, 3 inch
24 Packages of filter paper, 4 inch
30 Flasks, best Bohemian, 4 ounce
30 Flasks, best Bohemian, 8 ounce
30 Flasks, best Bohemian, 16 ounce
3 dozen German glass funnels, 2 1-2 inch
24 pairs Steel forceps, 5 inch
24 Gas bottles, 8 ounce
50 Rubber stoppers, two holes, to fit gas bottles
5 pounds Glass tubing, 1-8 and 3-16 inch bore
2 pounds Glass rods, 1-8 inch diameter
2 quires Test paper, litmus and turmeric
24 Mortars, 2 1-2 inch
4 feet Platinum wire
30 2 ounce retorts with stoppers, best Bohemian
48 feet 1-4 inch bore rubber tubing
48 feet 3-16 inch bore rubber tubing
30 Tin sand baths, 5 inch
4 Hand scales, 6 inch beam
4 Sets weights, 0.1 gram to 50 grams
24 Test tube racks
36 dozen Test tubes, 6 inches by 5-8 inch
24 Test tube brushes
3 dozen Watch glasses, 2 inch
2 Coddington lenses
24 squares Blue glass
48 Hard glass test tubes, 6 inch
6 Lamp tips
24 Filtering stands, 1 arm, 2 holes
2 dozen Iron wire triangles
24 Pneumatic troughs, made by fitting half gallon or gallon crock with metal shelf
30 Retort stands
1 package Filter paper, 10 inch

CHEMICALS.

As the chemicals required will vary somewhat with different text-books, the list recommended by the text selected should be provided.

SUMMARY OF EQUIPMENT.

Fixtures and permanent equipment	$150.00
Apparatus more or less permanent	200.00
Chemicals	80.00
Total	$430.00

If the teacher can not find time to teach the class in two sections of 12 each, extra tables to accommodate the whole class (24) at once would cost approximately $35.00

MAINTENANCE.

The yearly cost of "apparatus more or less permanent," which must be replaced on account of breakage, will be approximately	$40.00
The yearly cost of chemicals, approximately	40.00
Total annual expenditure	$80.00

Dealers in Chemical Apparatus.

Apparatus and supplies may be obtained from the following firms: Eimer and Amend, 295-211 Third Ave., New York City; Wm. Gaertner and Co., 5345-5349 Lake Ave., Chicago; E. H. Sargent and Co., 143-145 Lake Street, Chicago; Henry Heil Chemical Co., 212-214 South Fourth Street, St. Louis; Scientific Materials Co., Pittsburgh, Pa.; Central Scientific Có., 345 West Michigan Street, Chicago; Kewaunee Manufacturing Co., Kewaunee, Wis.; (Desks); L. E. Knott Apparatus Co., Boston, Mass.; Bausch and Lomb Optical Co., Rochester, N. Y.; Woldenberg and Schaar, 387 Wabash Ave., Chicago; C. H. Stoelting Co., 121 North Green Street, Chicago; Max Kohl, Chemnitz, Germany; Drs. Peters and Rost, Chaussee Strasse, Berlin, Germany.

GENERAL BIOLOGY, BOTANY AND ZOOLOGY.

A LABORATORY EQUIPMENT FOR TWELVE PUPILS WORKING AT THE SAME TIME.

APPARATUS.

6 Compound microscopes, from $20 to $30 apiece	$......
2 Laboratory tables, with drawers, 96 inches long, 36 inches wide, 29 inches high, heavy white pine, oiled top	20.00

12	pairs Scissors, fine	6.00
12	Scalpels	3.00
12	pairs Forceps, medium fine, straight points	4.80
24	Dissecting needles	1.00
6	Section razors	6.00
12	Dissecting lenses, one inch focus (or reading glasses 2½ inches in diameter)	12.00
1	Balance, with weights	4.25
2	gross Glass slides, 3x1 inches	2.00
4	ounces Cover glasses, ¾ inch square	3.20
24	Syracuse watch glasses	1.25
24	Pipettes, with rubber bulbs	.75
2	pounds Glass tubing, assorted sizes	1.50
1	lot Large flat dishes, glass or porcelain	.....
24	Mason fruit jars, quart	2.00
24	Test tubes	.38
1	lot Guarded bristles	.....
1	Galvanized iron waste can, with cover	1.25
1	lot Battery jars, large	.....

REAGENTS AND CHEMICALS.

10	pounds Formalin	2.50
1	gallon Alcohol, 95 per cent	4.00
1	quart Absolute alcohol	1.90
1	pound Ether	.85
1	pound Mercury	1.50
2	gallons Distilled water	.....
1	pound Glycerine	.50
1	pound Turpentine	.15
½	pound Cedar oil	.75
3	ounces Balsam, in xylol	.60
1	pound Glacial acetic acid	.50
1	pound Sulphuric acid	.30
1	pound Hydrochloric acid	.15
1	pound Nitric acid	.50
½	pound Picric acid, crystals	.75
½	pound Corrosive sublimate	.60
1	pound Chloroform	.75
1	pound Caustic potash	.40
½	pound Potassium cyanide, fused lumps	.45
1	ounce Iodine, resubl	.60
½	ounce Methyl green	.40
6	ounces Haemalum, solution	.60

3 ounces Acid carmine, solution	.70
½ ounce Eosin, powder	.45
1 ounce Pith, for sectioning	.10

All of the above are list-prices, except those for compound microscopes, which are special prices for schools.

Although all of the articles given in the above lists are recommended, nevertheless good work can be done with a smaller equipment. In the average school much will depend upon the teacher's ingenuity in divising substitutes for apparatus at little or no expense. Aquaria for keeping aquatic forms alive in the laboratory are necessary and for this purpose large battery jars will be found satisfactory. One dozen tumblers, some wide mouthed bottles with corks for water or sand cultures, a few thistle tubes, some rubber stoppers, rubber tubing, beeswax or paraffine, and some bibulous paper will be found helpful additions for any work in plant physiology. A few stoneware saucers will also be found indispensable for work on the germination of seeds. Insect cages may be readily made of wire or cotton netting placed over pans or trays filled with earth in which the plants, used as food by the insects, are growing. These, and many other contrivances, for making observations and experiments upon living animals and plants in the laboratory are of the greatest value, as the chief stress should be laid upon this phase of the instruction.

The following dealers in laboratory supplies and apparatus are recommended:

Dealers in Animals for Class Work.

Brimley, H. H. & C. S., Raleigh, N. C. Live and preserved material.
Marine Biological Laboratory Supply Dept., Woods Hole, Mass. Preserved marine material.
McCurdy, B. F. & Co., 312 E. 65th Place, Chicago. Live material.
Powers, H. H., Station A, Lincoln, Neb. Living amoeba, paramoecium, hydra, etc., and miscellaneous slides.

Zoological Supply Department of the University of Missouri.

The Department of Zoology of the University of Missouri has frequently received from teachers in all parts of the State requests for dissection and demonstration material to be used in teaching this subject. These requests have been answered with references to dealers in such supplies, or with simple directions regarding the collection and preservation of the material which could be found near at home. But to secure supplies in small quantities from dealers at a distance was both troublesome and expensive, while the teachers were often unable, or had not the time, to obtain living or properly preserved material from the local fauna. Accordingly, a plan for establishing a zoological supply department at the University was submitted to superintendents of accredited schools. Since only favorable replies were received and since similar plans have been successfully carried out in other states, it was decided to establish the department.

The department is prepared to furnish to the accredited schools of the state living and preserved materials from the local land and fresh-water fauna, and also the marine forms that are ordinarily used. In addition to the forms used for student dissection, simple museum specimens and microscopic preparations may be secured. Furthermore, explanation of methods of collecting and preserving material will be made, in order to assist the schools in obtaining material locally. All supplies will be furnished *at cost*, and the schools will have the further advantage of low transportation charges and prompt delivery.

This department is not in operation between June 1st and October 1st. The current price list and further information may be obtained by addressing the Zoological Supply Dept., 509 South 9th St., Columbia, Mo.

Dealers in Laboratory Apparatus and Supplies for Botany and Zoology.

Bausch, Lomb Optical Co., Rochester, N. Y.

Microscopes and Supplies.

Cambridge Botanical Supply Co., Cambridge, Mass. General botanical equipment, preserved material and fresh marine algae.

Drury, Miss E. M., 45 Munroe Street, Roxbury, Mass. Slides and botanical material.

Eimer & Amend, 205-211 Third Ave., N. Y.

Microscopes and Supplies.

Krafft, Wm., 30 E. 18th St., N. Y.; also 32 Clark St., Chicago. Agent for Leiz Microscopes. Supplies.

Spencer Lens Co., Buffalo, N. Y. Microscopes and supplies.

PHYSIOLOGY.

The apparatus and chemicals necessary for the accurate measurement and observation of the activity of such organs as the heart, respiratory system, muscles, nerves, etc., and for the chemical study of the blood, the digestive process, etc., can be had at a comparatively small cost. The lists given below contain some things for which the ingenious teacher may himself make very effective substitutes at little cost, save time and his own labor. The minimum outfit for effective work is as follows:

GENERAL EQUIPMENT.

Student tables, size of top, 34x54, height 34 inches....	$100
Stools, two to each table	
Gas, water and electrical connections with a clock beating seconds	
General chemical table and shelves	
General supply of chemicals	
Simple wall pendulum or clock beating seconds, with mercury contact, etc.	

GENERAL APPARATUS, NOT DUPLICATED, FOR DEMONSTRATIONS.

1	Mercury Manometer and blood pressure outfit.........$	5.00
1	Circulation model	4.00
1	Respiration model	2.00
1	Artificial eye	3.00
1	Color wheel or a small electric motor, with set of color discs	8.00
	Assorted glass tubing	1.00
	Assorted rubber tubing	1.50
	Assorted corks	3.00
1	Shellac outfit	1.00

SPECIAL SETS OF APPARATUS AND CHEMICALS

FOR EACH GROUP OF TWO OR FOUR STUDENTS WORKING TOGETHER.

a. For physiological experiments.

1	Table, size 34x54x34 inches ....$10.00 to $	20.00
2	Stools, height 20 inches	1.00
1	Recording drum and clockwork	20.00
1	Induction coil	7.00
1	Platinum stimulating electrode	1.00
2	Dry batteries	.60
2	Porcelain base (knife edge), electric keys	.30
1	Muscle lever	1.15
1	Muscle clamp	1.00
100	Weights, 10 gram, lead	.30
1	Heart lever, of straw	1.00

1	Heart lever holder (use muscle lever holder)	1.15
1	Signal magnet (electric, for the time circuit)	1.05
1	Tuning fork, 100 double vibrations a second	1.00
2	Iron stands, heavy base	2.00
2	Simple clamps, burette	.60
2	Burette clamps, universal	.80
100	Sheets glazed paper, 6x20 inches	.50

b. For physiological chemical experiments.

1	Set chemical apparatus, containing 6-inch file, 100 filter papers, 4-inch funnel, bunsen burner, 100 c. c. graduated cylinder, 4-inch flat bottom evaporating dish, 300 c. c. flask, test tube rack and dozen test tubes, set of 3 beakers, 100° Centigrade thermometer, costing in all about	6.00
1	Set student chemicals containing starch, dextrine, dextrose, acetic acid, nitric acid, hydrochloric acid, picric acid, ammonia, caustic soda or potash; sodium chloride, magnesium sulphate, ammonia sulphate, calcium chloride, copper sulphate, glycerine, pepsin, ptyalin, pancreatin and fibrin, costing in all about	6.00
1	Set chemical reagent bottles	4.00

Dealer in Apparatus.

Harvard Apparatus Co., Back Bay P. O., Boston, Mass.

PHYSICAL GEOGRAPHY.

A LABORATORY EQUIPMENT FOR TWELVE PUPILS WORKING AT THE SAME TIME.

GENERAL EQUIPMENT.

A collection of common rocks and minerals	$ 2.50
Sun board	6.00
Six self-registering maximum and minimum thermometers	3.65
Sight compass	5.65
Rain gauge	2.75
Wind vane (made by students)	
Anemometer (made by students)	
Mason's hygrometer	5.00
Globe, 12 inch	6.00
Physical maps of the continents and the United States, in spring roller case	29.35

Daily and monthly weather maps. The daily maps may be obtained from the nearest weather bureau station, the monthly from the Weather Bureau at Washington, D. C.

TOPOGRAPHIC MAPS.

Order maps from the United States Geological Survey, Washington, D. C. The topographic maps cost five cents each in lots of one hundred. The following list includes all maps mentioned in the bulletin "*A Unit in Physical Geography*." The number of copies of each map needed will depend upon the number of pupils in the class and the plan of work. There should be one map for each two students, whether working in one section or more than one. If the class is divided into groups and each group studies different sheets, fewer copies of each will be needed.

Simple plain or plateau: Thibodeaux, Louisiana; Fargo, North Dakota; Bowling Green, Ohio; Coude, South Dakota; Chicago, Illinois.

Simple mountain ridge: Harrisburg, Pennsylvania; Delaware Water Gap, New Jersey-Pennsylvania.

Plain with young valleys: Wilson, New York; Fostoria, Ohio; Dublin, Ohio.

Mountains with shallow valleys: Shasta, California; Harpers Ferry, Virginia-Maryland.

Plains with well-defined valleys: Palmyra, Missouri; Wicomico, Maryland; Olivet, South Dakota.

Dissected mountains: Mt. Marcey, New York; White Mts., New Hampshire.

Dissected plains: Lancaster, Wisconsin; Versailles, Missouri; Hazard, Kentucky; Ironton, Ohio-Kentucky.

Past mature plains: Clinton, Missouri; Nevada, Missouri; O'Fallon, Missouri.

Plains with hills and valleys: Warrenton, Virginia; Frederick, Maryland.

Plains with hills: Eagle, Wisconsin; Oswego, New York; Baldinsville, New York.

Plains with mountain ridges and valleys: Harrisburg, Pennsylvania.

Maps of valleys: Map of alluvial valley of the Mississippi River; Kansas City, Missouri; Wheeling, West Virginia-Ohio; Niagara Falls, New York; Harpers Ferry, Virginia-Maryland; Albany, New York; Charleston, West Virginia; Hinton, West Virginia; Sullivan, Missouri; Marseilles, Illinois; St. Louis, Missouri; East and West sheets. Map of the United States showing the Mississippi, Potomac, Delaware and other river basins.

Ponded rivers: Norwich, Connecticut; Perch Lake, Michigan.

Drowned valleys: New London, Connecticut; Saybrook, Connecticut; Washington, D. C.; New York City, New York.

River deposits (flood plains): Marshall, Missouri; St. Louis, Missouri-Illinois; Kansas City, Missouri; Thibodeaux, Louisiana; Gibson, Louisiana; The Alluvial Valley of the Mississippi River.

Maps of recently drained lake bottoms or recently uplifted sea bottoms: Fargo, North Dakota-Minnesota; Chicago, Illinois; Fostoria, Ohio; Camden, New Jersey; Edenton, North Carolina; Trent River, North Carolina.

Wind deposits: Kingsley, Kansas; Brown's Creek, Nebraska; Campe Clark, Nebraska; Provincetown, Massachusetts.

Glacial deposits: Moraines: Eagle, Wisconsin; Charleston, Rhode Island; Brooklyn, New York; Plainfield, New Jersey. Drumlins: Oswego, New York; Baldwinsville, New York; Boston, Massachusetts; Sun Prairie, Wisconsin. Sand and gravel plains: Jonesville, Wisconsin; Plainfield, New Jersey; Great Egg Harbor, New Jersey; Lynn, Massachusetts; Boston Bay, Massachusetts; Sandy Hook, New Jersey.

The following maps illustrate some of the erasive effects of glaciers, waves of seas and lakes:

U-shaped valleys: Leadville, Colorado (the high valleys); Watkins, New York; Hammondsport, New York.

Fiords: Methow, Washington; Stehekin, Washington; Juneau, Alaska.

Lakes: Webster, Massachusetts; Franklin, New Jersey; Paradox Lake, New Jersey; Plymouth, Massachusetts, Minneapolis, Minnesota.

Shore cliffs: Sandy Hook, New Jersey; San Francisco, California; Boston Bay, Massachusetts.

Volcanic deposits: Volcanic Cones: Mt. Shasta, California; Lassen Peak, California; Mt. Tabor, New Mexico.

Lava plains and plateaus: Modoc Lava Beds, California; Bisuka, Idaho.

Laccolite mountains: San Rafael, Utah; Henry Mountains, Utah.

Good illustrative maps: Dunlap, Illinois; Kanawha Falls, West Virginia; Hinton, West Virginia; Ocean, West Virginia; Chattanooga, Tennessee; McMinnville, Tennessee; Cleveland, Tennessee; Suwanee, Tennessee; Ringgold, Tennessee; Belchertown, Massachusetts; Northampton, Massachusetts; Springfield, Massachusetts; Charleston, West Virginia; Nichols, West Virginia; Echo Cliffs, Arizona; Tooele Valley, Utah; Kaaterskill, New York; Mt. Marcy, New York; Catskill, New York; Disaster, Nevada; Granite Range, Nevada; Harrisburg, Pennsylvania; Pine Grove, Pennsylvania.

CHARTS.

Atlantic Ocean.	
Sailing charts, A, B, C, D, each	$ .50
General charts of the coast, Nos. 6, 7, 376, 11, 19, 21, each	.50
Coast charts, Nos. 105, 106, 120, 121, each	.50
Pacific Ocean.	
Sailing charts, S.	.50
General charts of the coast, Nos. 550, 6,000, 8,100, 8,200, each	.50
Harbor chart, No. 5581	.50
One set Tide tables, Atlantic Coast; U. S. Coast and Geodetic Survey	.25
One set Tide tables, Pacific Coast; U. S. Coast and Geodetic Survey	.25
Weather maps. Order from U. S. Weather Bureau, St. Louis, Missouri.	

ADDITIONAL APPARATUS.

The following additional apparatus, very desirable, but not essential, should be added as soon as possible.

Relief maps, by Prof. Harry Keeler, of the Englewood High School, Chicago, to illustrate typical regions in the different stages of development, making them especially valuable in Physical Geography. It will be noticed that the prices are about 50 per cent of those formerly charged for reliable maps. The following are recommended:

SUBJECT	Size over all, inches	Horizontal Scale	Vertical Scale	Price Net	EXAMPLE
Niagara	38"x15.5"	1 in. = 1 mile	4 to 1	$20.00	Water Falls, and Stream Erosion
Shasta	22.5"x17"	1 in. = 1 mile	True Scale	17.50	A Young Volcanic Mountain
Crater Lake	20"x16"	1 in. = 1 mile	2 to 1	17.50	A Crater
Grand Canyon	20.5"x17.5"	1 in. = 4 miles	2 to 1	17.50	Weathering and Steam Erosion
Marshall, Mo.	21"x17"	1 in. = 1 mile	2 to 1	17.50	A Graded River
Ottawa, Ill.	21"x17 "	1 in. 1 mile	2 to 1	17.50	Work of Young Stream
Teachers Model	24.5x15.5"			15.00	See Note

Slated globe 10 in. with movable semi-circle	$ 3.00
Series of lantern slides to illustrate the phenomena of Physical Geography. Selected and prepared by Wallace W. Atwood, of the University of Chicago, and Jane Perry Cook, of the Chicago Normal, with descriptive text for each slide. (Circular sent upon application.) Complete set, 550 slides, each	.40
College bench lantern with objective, condensing lens and slide carrier. (Illuminant extra depending upon kind wanted.)	27.00
Helidon invented by Prof. J. F. Morse, of the Medill High School, Chicago, an adjustable appliance for demonstrating the apparent path of the sun through the sky at equinox and solstice times with reference to the horizon and zenith of an observer at any latitude. (Circular upon application.) Net	10.00
Soil thermometer	1.10
Barograph (Duty free)	20.00
Thermograph (Duty free)	20.00

Note.—Write the Central Scientific Company, 345 to 359 West Michigan Street, Chicago, Illinois, for catalogue X, Agricultural and Physiographical Apparatus. Every teacher of Physical Geography should have a copy of this catalogue.

AGRICULTURE.

MATERIAL TO BE COLLECTED BY TEACHER AND STUDENTS AT THE BEGINNING OF THE YEAR.

1 bushel clean sand.
1 bushel sandy loam soil.
1 bushel clay.
8 quarts leaf mold (well rotted).
1 bushel rich soil for use in growing house plants.
Samples of commercial fertilizer, with analysis and prices given.
Collection of economic seeds. (These may be secured free of U. S. Department of Agriculture. In ordering this collection, address U. S. Dept. of Agriculture, Seed Laboratory, Washington, D. C. When ordering send $1.50 to Mackall Bros., 9th and H. Streets, N. E., Washington, D. C. This is to pay for the tray and vials used in packing the collection. Notify the Department that the money has been sent to pay for tray and vials.)

Collections of economic seeds prepared by teacher and students.

1. Seeds of the following trees: oak, walnut, hickory, hazel, apple, pear, peach, cherry, plum, etc.
2. Cereals: corn, wheat, oats, rye, barley, rice, etc.
3. Grasses and clovers: red clover, alsike, white clover, alfalfa, timothy, millet, orchard grass, blue grass, Johnson grass, Bermuda grass, cowpeas, redtop, etc.
4. Common weeds: purslane, morning glory, Jamestown weed, cocklebur, cheat, ragweed, horseweed, etc.

APPARATUS FOR SOIL STUDIES.

EQUIPMENT FOR TWENTY STUDENTS.

1 pair of balances weighing to grams or quarter ounces. (A four-pound postal scale may be used.)
5 glass tumblers.
10 wide mouthed 8-ounce bottles.
10 pint glass fruit jars.
5 thermometers.
10 student lamp chimneys.
10 shallow pans.
½ ℔ glass tubing (small sizes).
¼ ℔ glass rods (small sizes).
Filter paper.
Litmus paper.
5 glass or tin funnels.
5 small sieves of various meshes.
10 six-inch flower pots.

MATERIAL FOR PLANT STUDIES.

EQUIPMENT FOR TWENTY STUDENTS.

10 heavy dinner plates for seed germination.
10 panes of glass (8x11 inches).
10 small microscopes.
Quantity of heavy cotton cloth for use in seed germination.
10 shallow wooden boxes (12x18x3 inches) for growing cuttings, etc.
Apparatus for Babcock milk test (cost $5.00).
If possible, not less than one-half acre of good land for a school garden and experiment field. (If the school has no such plot, land from a nearby farm may be rented.)

Apparatus now in the physical, chemical, or biological laboratory need not be duplicated for agriculture. Much of the material can be made by the students or brought from their homes. The entire list should be purchased through a local dealer for about $18.00.

MANUAL TRAINING.

FOR A UNIT IN WOODWORKING.

MINIMUM INDIVIDUAL EQUIPMENT.

1 Bench and vise	$ 8.75
1 Bailey No. 4 smooth plane	1.60
1 2', two fold rule	.12
1 12″ back saw	1.10
1 No. 162 Stanley marking gauge	.15
1 No. 20 Stanley try square	.20
1 Sloyd knife 2½″ blade	.18
1 ¼″ firmer chisel	.30
1 1″ firmer chisel	.40
1 Spoke shave, Stanley No. 64	.12
1 Maple bench hook	.18
1 Bench brush	.25
Total	$ 13.35

MINIMUM GENERAL EQUIPMENT.

1 Disston No. 7 or Jenning's crosscut saw, 10 points, 24″	$ 1.25
1 Disston No. 7 or Jenning's rip saw, 8 points, 24″	1.25
1 Bit brace, 8″ sweep	1.00
1 Miller's Falls hard drill, No. 2	1.30
1 Keyhole saw	.40
1 14″ turning saw with frame	.90
1 Screw driver, 4″ blade	.18
1 Screw driver, 6″ blade	.20
2 6″ wing dividers	.30
2 6″ T bevels	.40
2 Adz eye claw hammers, 10 oz.	1.00
6 ¾″ gouges, outside ground	3.00
1 Set auger bits	3.00
3 Scrapers	.25

3 Nail sets, assorted	.20
4 10″ hand screws	2.70
6 7″ hand screws	2.50
1 Mounted oil stone	.75
1 Steel oiler	.10
1 Mounted grindstone	6.00
Total	$ 26.68

MEDIUM INDIVIDUAL EQUIPMENT.

1 Bench and vise	$ 10.00
1 Jack plane, Bailey No. 5	1.80
1 Block plane, Stanley No. 220	.45
1 2' two fold boxwood rule	.12
1 12″ back saw	1.10
1 2½″ mallet	.15
1 Marking gauge, Stanley No. 162	.15
1 Try square, 6″ blade, Stanley No. 20	.20
1 6″ wing dividers	.15
1 Sloyd knife, 2½″ blade	.18
1 Screw driver, 4″ blade	.18
1 ¼″ dowel bit	.20
1 ½″ dowel bit	.30
1 ¼″ firmer chisel	.30
1 ½″ firmer chisel	.35
1 1″ firmer chisel	.40
1 Spoke shave, Stanley No. 64	.12
1 Maple bench hook	.18
1 Bench brush, bristle	.25
Total	$ 16.58

MEDIUM GENERAL EQUIPMENT.

3 Disston No. 7 or Jenning's crosscut saws, 10 points, 24″	$ 3.75
3 Disston No. 7 or Jenning's rip saws, 8 points, 24″	3.75
1 Set auger bits, 3-16″ to 1″, inclusive	3.00
1 Miller's Falls hand drill, No. 2	1.30
1 Keyhole saw	.40
1 14″ turning saw	.90
1 Screw driver, 6″ blade	.20
4 6″ T bevels	.80
3 Nail sets, assorted	.20

4 10 oz. adz eye claw hammers	2.00
3 Bit braces, 8″ sweep	3.00
6 ¾″ gouges, outside ground	3.00
1 Set J. S. Addis carving tools	4.00
1 Framing square	1.10
4 Scrapers	.35
6 10″ hand screws	4.00
6 7″ hand screws	2.50
2 Carpenter's steel clamps, 48″	3.60
2 Mounted oil stones	1.50
2 Steel oilers	.20
1 Mounted grindstone	9.00
Total	$ 48.55

VERY COMPLETE INDIVIDUAL EQUIPMENT.

1 Bench and vise, with lockers	$ 16.50
1 Stanley "Bed Rock" jack plane, No. 605	2.10
1 Stanley block plane, No. 15	.80
1 2′ two fold rule	.12
1 12″ back saw	1.10
1 Disston No. 7 or Jenning's crosscut saw, 22″, 10 points	1.25
1 Disston No. 7 or Jenning's rip saw, 22″, 8 points	1.25
1 Ratchet bit brace, 8″ sweep	1.50
1 10 oz. adz eye claw hammer	.50
1 2½″ mallet	.15
1 Stanley marking gauge, No. 165	.28
1 Stanley try square, 6″ blade	.20
1 6″ T bevel	.20
1 6″ wing dividers	.15
1 Sloyd knife, 2½″ blade	.18
1 Screw driver, 4″ blade	.18
1 ¼″ dowel bit	.20
1 ½″ dowel bit	.30
1 ¼″ firmer chisel	.30
1 ½″ firmer chisel	.35
1 1″ firmer chisel	.40
1 Spoke shave, Stanley No. 64	.12
1 Nail set	.08
1 Maple bench hook	.18
1 Bench brush (Bristle)	.25
Total	$ 28.64

VERY COMPLETE GENERAL EQUIPMENT.

1	Disston No. 7 or Jenning's crosscut saw, 8 points, 26″	$ 1.50
1	Disston No. 7 or Jenning's rip saw, 6 points, 26″	1.50
1	Set auger bits, 3-16″ to 1″, inclusive	3.00
1	Clark's expansive bit	1.00
1	Miller's Falls hand drill No. 2	1.30
3	Keyhole saws, assorted	.80
2	14″ turning saws with frames	1.80
1	Langdon mitre box with saw	9.35
1	Drawing knife, 8″ blade	.95
1	Framing square, rustless	1.10
1	Stanley universal plane with bits	12.00
6	1″ gouges, outside ground	3.60
6	¾″ gouges, outside ground	3.00
1	Set J. S. Addis carving tools, No. 12	5.75
6	Scrapers, assorted	.50
6	Brad awls, assorted	.25
1	Bailey No. 8 jointer	3.00
6	10″ hand screws with iron screws	4.80
6	8″ hand screws with iron screws	4.40
4	Carpenter's steel clamps, 48″	7.20
2	Oil stones, mounted	1.50
2	Steel oilers	.20
1	Mounted grindstone, treadle attachment	12.00
	Total	$ 80.50

Note.—In making an estimate of the cost of an equipment, about 10 per cent should be added to the estimate given here. This will be needed for extras and unforeseen wants.

Dealers.

Schroeter Bros., Hardware Co., 717-719 Washington Ave., St. Louis, Mo.; Simmons Hardware Co., St. Louis, Mo.; Orr & Lockett Hardware Co., 71-73 Randolph St., Chicago, Ill.; E. H. Sheldon & Co., 320 North May St., Chicago, Ill.; Hammacher, Schlemmer & Co., 4th Ave. & 13th St., New York City; The Chas. A. Strelinger Co., 96 Bates St., Detroit, Mich.

FOR A UNIT IN MECHANICAL DRAWING.

EQUIPMENT FOR A CLASS OF TWENTY PUPILS WORKING AT THE SAME TIME.

20	Sets of drawing instruments	$ 60.00
20	T-squares. Cherry	8.00

20	Xylonite Triangles, 45, 7 in.	8.00
20	Xylonite Triangles, 30x60, 7 in.	7.00
20	White pine drawing boards, 20x25 inches	18.00
20	Architects triangular scales	8.50

Each pupil should possess the following:

1	Dozen thumb tacks	$ .05
1	Pencil and ink eraser	.05
1	Sponge eraser	.10
1	Sketch book, for pencil	.10
1	Pencil, soft, finest grade, No. 2	.10
1	Pencil, 4 H, for mechanical drawing	.05
1	Bottle Higgins' black drawing ink	.25

Drawing paper in large sheets, size 19x24, of good quality, for mechanical drawing, may be had from 2 to 5c per sheet.

Dealers in Drawing Material.

The following firms are reliable: Eugene Dietzgen Co., Chicago; F. Weber & Co., St. Louis; A. S. Aloe Co., St. Louis; Keuffel & Esser Co., St. Louis.

DOMESTIC SCIENCE AND ART.

The first consideration in planning a laboratory for Domestic Science is the use to which it is to be put. If it is to be used for food work only, the tables should be only 2 ft. wide; if it is to be used for both food work and sewing, the tables should be from 2½ to 3 ft. wide, and the stoves should be placed on them so as to be reached easily from the side on which the student works, and to be removed easily when the tables are to be used for sewing purposes.

As to the arrangement of tables, for the cheaper equipments long tables so placed as to form a hollow square are probably the most satisfactory. The table tops, if of wood, should be well oiled so as not to absorb stains of any kind. Tile tops are, of course, to be preferred for the food work, but are much more expensive. A drawer should be provided for the individual equipment of each pupil, and, if sewing is to be given also, a separate drawer should be provided for this. A sufficient number of cases should be furnished for storing general equipment and supplies.

The floor and walls should be so finished as to be easily kept clean. If an old floor is to be used, the cracks should be filled and the floor painted. The walls should be painted or covered with one of the various kinds of sanitary paper.

COOKING.

Suggestions are given below for one of the cheapest equipments for schools where gas is not available and where the equipment must be portable so as to be got out of the way when not in use, and also for an equipment where a room can be set apart exclusively for the work and where gas is available.

If further information is desired, the reader is referred to an article by Mrs. Helen Kinne in the Teachers College Record for May, 1909. This can be secured for thirty cents from Teachers College, Columbia University, New York City.

1	gasoline stove	$ 7.50
1	oven	3.00
12	individual stoves (@ .75)	9.00
3	table tops (2x12)	4.50
12	boxes (5c ea.)	.60
3	boxes with hinges	2.00
12	sets of apparatus (each costing, $1.04)	13.68

Bread board	$ .10
Sauce pan	.10
Double boiler	.25
Pan	.05
Bowl	.10
Cup. (measure)	.08
Baking dish	.05
Cover	.05
Pie tin	.05
2 teaspoons	.03 1-3
1 tablespoon	.06 2-3
Knife and fork	.06 2-3
Sharp knife	.05
Egg beater	.01
Frying pan	.08
	$ 1.14

6	thermometers at 30c.	$ 1.80
1	balance	3.00
100	test tubes	1.00
	Beaker	2.00
	Rolling pins	.30
	Flour sifter	.10
6	dish pans	1.50
3	wire egg beaters	.30
	Tea kettle	.75

Soup kettle	.25
Mixing bowls	.50
Frying kettle	.75
Muffin pan	.50
Cake pan	.60
6 small tin buckets	.30
Large sauce pan	.25
Scrubbing brush	.15
Carving knife	.25
Biscuit cutter	.15
Tea pot	.25
Coffee pot	.25
Grater	.10
Total cost	$ 55.33

When a room can be set apart for this work and gas can be had, the following should be substituted for the first six items in the above list:

Coal range	$15.00	to	$ 30.00
Gas stove	18.00	to	30.00
3 12x2 hard wood tables. (Hard wood is desirable but soft wood is cheaper.)			60.00
Case for supplies			25.00
Sink installed with drain board			30.00
Refrigerator			28.00
Total cost, including the above substitutions			$231.73

SEWING.

GENERAL EQUIPMENT.

A small room or corner screened for fitting.

1 mirror	$ 6.00	to	$ 25.00
Machines (1 for each three or four pupils)	22.00	to	30.00
Tables (9 sq. ft. for each pupil).			
Lockers to hold work (if drawers for this purpose are not provided in tables).			
Chairs.			
Stools.			

INDIVIDUAL EQUIPMENT.

1 short ruler (1 ft.) graded in inches	$ .05
1 long ruler (metal edge)	.20
Scissors	.75
Tape measure	.05
Pin cushion	.10
Thimble	.10
Box to hold equipment	.05
Total cost	$ 1.30

III.

SUGGESTIONS FOR THE EQUIPMENT OF LIBRARIES.

GENERAL INFORMATION.

In accordance with the law approved March 19, 1901, it is made mandatory upon the district boards of directors to set aside, out of the levy for incidental purposes, not less than five nor more than twenty cents per pupil enumerated in the district each year, which shall be spent, under the direction of the board, in purchasing books, the first hundred of which shall be from a list selected by the State Library Board. (R. S. 1909, Sec. 8186.)

In addition to this provision, the qualified voters in each school district (outside of an incorporated city) have the power, at the annual meeting, by a majority of the votes cast, to vote such a sum as they may deem proper, not to exceed two mills on the dollar, for the purchase of books for a district library. (R. S. 1909, Sec. 8196.)

In cities containing 1,000 and less than 100,000 inhabitants, the Board of Education has power "to establish and maintain a library for the use of the public school district therein," and to appropriate the following sums therefor: 20,000 and under 100,000 inhabitants, $2,500; 5,000 and under 20,000, $500; 1,000 and under 5,000, $250. (R. S. 1909, Sec. 10871.)

This is, in brief, the state of the law in Missouri in reference to the school library. The list of books spoken of in the first paragraph, which may be obtained from the State Superintendent, contains largely books suited to the lower grades. It is with the hope of stimulating the growth of the high school libraries throughout the State and directing that growth in the right direction that these suggestions are made.

Books can generally be purchased to the greatest advantage through some large retail book shop. The firm of A. C. McClurg, 215 Wabash Avenue, Chicago, is recommended for domestic books and that of G. E. Stechert, 151 West 25th St., New York, for foreign books. Low discounts may usually be secured from local booksellers. It is seldom of advantage to deal with the publisher direct. If a large order is sent, a discount of about thirty per cent from the price named in the following lists may be expected. The discount will vary on different books and on some no discount can be given. In writing for books, one should be particular to state *exactly* what is wanted, giving author, title, edition, and publisher.

When the books arrive they should be compared with the order and the bill and entered in an accession book. This book, which can be obtained already ruled from the Library Bureau, 156 Wabash Ave., Chicago, is intended to be an exact record of the books in the library and is ruled for author, title, publisher, date, size, binding, house from which purchased and cost. This record is simply intended for business purposes. It is not a catalogue in any sense. One line is given to each volume and each line is numbered consecutively. Each volume, then, has a separate number which should be entered in some stated place on the volume itself, such as the foot of the page following the title.

Before the books are circulated, they should be marked indelibly in several places with the name of the library. A rubber stamp for this purpose can be had for a few cents. For example, the title page, the fifty-first page and the last page should be marked. It is a good idea to have a book plate printed and inserted on the inside cover of each book. The leaves of all uncut books should be cut.

If it is a possible thing, a separate room should be set apart for the library. This room should be made attractive and kept open all day long as a study room. If there is no fund from which to pay a librarian, the library should be placed in charge of one of the teachers, who should be held responsible for it. Good aids for the person in charge of the library are Dana's *Library Primer*, Stearns' *Essentials in Library Administration*, Hitchler's *Cataloging for Small Libraries*, Kroeger's *Aids in Book Selection* and *Binding for Small Libraries* and Brown's *Mending and Repair of Books*. *The Library Primer*, which costs $1.00, can be obtained of the Library Bureau, Chicago. The other books in the list, which cost 15c each, can be obtained of The American Library Association, 1 Washington St., Chicago.

Every means should be used to encourage pupils to read. They should be referred to definite books frequently and should be shown the books by the teacher. Supplementary reading in moderate quantities should be assigned. Pupils should be permitted to take the books home. During the vacation when the school house is closed, the books should be removed to the home of some one who will care for them and issue them as desired by the residents of the district.

If library is large enough to warrant the employment of a librarian, some one with a special library training should be employed. It is just as important that the librarian should have a special education as it is for the teacher. If a whole year cannot be given to the study, the librarian should take at least a course at some summer school of library economy.

Every library of over 1,000 volumes should be catalogued on cards. To be effective this work must be done by trained cataloguers. Card cases and other supplies can be had of the Library Bureau. A model catalogue can be secured from the Superintendent of Documents, Washington, D. C., by sending for a copy of the *A. L. A. Catalogue of 8000 Volumes for a Popular Library.* (Price, $1.00.) This is a most carefully selected list and is most useful as an aid in the selection of books. Printed cards of all the books listed can be obtained from the Library of Congress at a cost of two cents for each different card and one-half cent for each duplicate card. The *Handbook of Card Distribution*, which will be sent gratis, should be secured from the Library of Congress.

The Missouri Library Commission, Jefferson City, Missouri, will be glad to correspond with anyone who wishes suggestions regarding the establishment or administration of school libraries.

The following lists of books are suggested:

GENERAL REFERENCE BOOKS.

Note—The asterisk indicates that the book is especially valuable.

*Webster's *New International Dictionary*, (Springfield, Mass.) Merriam	$ 12.00
**New International Encyclopedia*, (22 Vols.), (N. Y.) Dodd, Mead	92.50
Lippincott's *New Gazetteer*, Philadelphia	10.00
*Rand-McNally's *Indexed Atlas of the World*, (2 Vols.),	18.50
Bartlett's *Familiar Quotations*, (Boston) Little	3.00
Stephen & Lee's *Dictionary of National Biography*, (22 Vols.), Macmillan	93.50

ENGLISH.

Note.—The asterisk indicates that the book is especially valuable.

FOR REFERENCE.

Language and Rhetoric:

Abbott, E. A., *Shakespearian Grammar*, Macmillan	$ 1.50
Alden, R. M., *Introduction to the Study of Poetry*, Holt	1.25
Bradley, H., *The Making of English*, Macmillan	1.00
Bright & Miller, *Elements of English Versification*, Ginn	.80
*Genung, J. F., *Working Principles of Rhetoric*, Ginn	1.40
*Greenough, B., and Kittredge, G. L., *Words and their Ways in English Speech*, Macmillan	1.10
*Hill, A. S., *Principles of Rhetoric*, New Edition, American Book Co.	1.20
Jespersen, O., *Growth and Structure of the English Language*, (N. Y.) Stechert	1.00
Johnson, C. F., *Forms of English Poetry*, American Book Co.	1.00
*Krapp, G. F., *Modern English*, Scribner	1.25
Lounsbury, T. R., *History of the English Language*, Holt	1.12
Nesfield, J. C., *English Grammar Past and Present*, Macmillan	1.10
Skeat, W. W., *An Etymological Dictionary of the English Language*, (1910), Oxford University Press	9.50
*Skeat, W. W., *Principles of English Etymology*, (2 Vols.), Clarendon	5.35
Sweet, H., *New English Grammar*, (2 parts), Clarendon Press	2.65
*Whitney, W. D., *Essentials of English Grammar*, Ginn	.75

BOOKS ON LITERATURE.

Adams, O. F., *Dictionary of American Authors*, Houghton	3.00
Alexander, W. J., *Introduction to Browning*, Ginn	1.00
Bates, Arlo, *Talks on the Study of Literature*, Houghton	1.50
Bradley, A. C., *Shakespearean Tragedy*, Macmillan	3.25
Bronson, W. D., *English Poems*, (4 Vols.), University of of Chicago Press	6.00
Brooke, S. A., *History of Early English Literature*, Macmillan	2.50
Child, C. G., *Early Plays*, (Riv. Ser.), Houghton	.40
Corson, H., *Introduction to Shakespeare*, Heath	1.50

Corson, H., *Introduction to the Study of Robert Browning's Poetry*, Heath	$ 1.50
Dixon, W. M., *Tennyson Primer*, Dodd, Mead	1.25
Dowden, E., *Shakspere: His Mind and Art*, Harper	1.75
English Men of Letters, ed. by J. Morley, (39 Vols.), Harper	29.25
Furnivall and Munro, *Shakespeare: Life and Work*, Cassell	.35
Gayley, C. M., *Classic Myths in English Literature*, Ginn	1.50
Gayley, C. M., *Representative English Comedies*, Macmillan	1.50
Gosse, E. W., *History of Eighteenth Century Literature*, Macmillan	1.50
Gummere, F. B., *Old English Ballads*, (Athen. Press), Ginn	.80
Gummere, F. B., *The Oldest English Epic*, Macmillan	1.10
Maccallum, M. W., *Shakespeare's Roman Plays and their Background*, Macmillan	2.50
Manly, J. M., *English Poetry*, Ginn	1.50
Manly, J. M., *English Prose*, Ginn	1.50
Minto, W., *Manual of English Prose Literature*, Ginn	1.50
Newcomer, A. G., *Twelve Centuries of English Prose and Poetry*, Scott, Foresman	1.75
Page, C. H., *Chief American Poets*, Houghton	1.75
Pollard, A. W., *English Miracle Plays*, Clarendon Press	1.90
Pound, L., *The Periods of English Literature*, University of Nebraska Press	.75
Raleigh, W., *Shakespeare*, Macmillan	.50
Raleigh, W., *Wordsworth*, (London) Arnold	2.00
Ryland, T., *Chronological Outlines of English Literature*, Macmillan	1.75
Saintsbury, G., *History of Elizabethan Literature*, Macmillan	1.75
Saintsbury, G., *History of Nineteenth Century Literature*, Macmillan	1.50
Stedman, E. C., *American Anthology*, Houghton	3.00
Stedman, E. C., *Victorian Anthology*, Houghton	3.00
Taine, H., *History of English Literature*, Holt	1.75
Thayer, W. R., *Best English Plays*, Ginn	1.40
Tolman, A. H., *Questions on Shakespeare*, University of Chicago Press ... Part I, 75c; Part 2,	1.00
Ward, T. H., *English Poets*, (4 Vols.), Macmillan	4.00
Wendell, B., *Literary History of America*, Scribner	3.00

ENGLISH CLASSICS.

Addison, J., *Spectator*, Macmillan	$ 1.50
Arnold, M., *Essays in Criticism*, (2 Vols.), Macmillan....	3.00
Austen, J., *Works*, (5 Vols.), Putnam..................	2.50
Bacon, *Essays*, ed. by West, Putnam	1.00
Blackmore, *Lorna Doone*, Ginn	.65
Boswell, *Life of Johnson*, (2 Vols.), (Everyman's Lib.), Dutton	.70
Browne, Sir T., *Religio Medici* and *Urn Burial*, (Everyman's Lib.), Dutton	.35
Browning, R., *Complete Works*, (Cambridge ed.), Houghton	3.00
Bryant, W. C., *Poetical Works*, (Household ed.), Appleton	1.50
Bunyan, J., *Pilgrim's Progress*, (Everyman's Lib.), Dutton	.35
Burns, R., *Poems, Songs and Letters*, (Globe ed.), Macmillan	1.75
Burke, E., *Selected Works*, (3 Vols.), Macmillan	3.60
Byron, Lord, *Poems*, (Cambridge ed.), Houghton	3.00
Carlyle, T., *Heroes and Hero Worship*, (Athen. Press), Ginn	.80
Carlyle, T., *Sartor Resartus*, (Athen. Press), Ginn	.80
Chaucer G., *The Student's Chaucer*, ed. by Skeat, Macmillan	1.75
Clemens, S. L., (Mark Twain), *Works*, (Complete sets, 18 Vols.), Harper	33.50
Coleridge, S. T., *Poetical Works*, (Globe ed.), Macmillan.	1.75
Cooper, J. F., *The Spy, The Pilot*, and the five "*Leatherstocking Tales*," (5 Vols.), (Everyman's Library), Dutton	1.75
Cowper, W., *Poetical Works*, (Globe ed.), Macmillan....	1.75
Defoe, D., *Robinson Crusoe*, (Everyman's Library), Dutton	.35
De Quincey, T., *Confessions of an English Opium Eater* and *Select Essays*, (3 Vols.), Scribner	5.00
Dickens, C., *Works*, (20 Vols.), Macmillan..............	20.00
Dryden, J., *Poetical Works*, (Globe ed.), Macmillan......	1.75
Evans, Mary A., ("George Eliot"), *Works*, (12 Vols. at .90), Harper	10.80
Emerson, R. W., *Works*, (5 Vols.), (Bohn Lib.), Bell....	4.35
Goldsmith, O., *Miscellaneous Works*, (Globe ed.), Macmillan	1.75

Gray, T., *Selections*, (Athen. Press), Ginn	$ .80
Harte, B., *Complete Poems*, (Cabinet ed.), Houghton	1.00
Harte, B., *The Luck of Roaring Camp, etc.*, Houghton	1.00
Hawthorne, N., *Works*, (8 Vols.), (Popular ed.), Houghton	10.00
Holmes, O. W., *Works*, (14 Vols.), (Riverside ed.), Houghton	21.00
Howells, W. D., *A Hazard of New Fortunes*, (2 Vols.), Harper	1.50
Howells, W. D., *The Rise of Silas Lapham*, Houghton	1.50
Irving, W., *Works*, (10 Vols.), Crowell	10.00
Johnson, S., *Lives of the Poets*, (2 Vols.), (World's Classics), Oxford Press	11.00
Keats, J., *Poetical Works*, (Globe ed.), Macmillan	
Kingsley, C., *Westward Ho*, Macmillan	1.00
Kipling, R., *Works*, (15 Vols.), Doubleday	15.00
Lamb, C., *Essays of Elia and Eliana*, Bell	1.00
Lamb, C., *Tales from Shakespeare*, Macmillan	1.50
Lanier, S., *Poems*, Scribner	2.00
Longfellow, H. W., *Complete Poetical and Dramatic Works*, (Cambridge ed.), Houghton	2.00
Lowell, J. R., *Poems*, (Household ed.), Houghton	1.50
Lowell, J. R., *Prose Works*, (7 Vols.), (Riverside ed.), Houghton	10.50
Macaulay, T. B., *Critical, Historical and Miscellaneous Essays*, (3 Vols.), Houghton	3.75
Malory, Sir T., *Morte D'arthur*, (Globe ed.), Macmillan	1.75
McPherson, J., *Ossian*, (Canterbury Poets), (London) Scott	.25
Meredith, G., *Works*, (16 Vols.), Scribner	24.00
Milton, J., *Poetical Works*, ed. by Beeching, Oxford Press,	.50
or by Masson, Macmillan	1.75
or by Moody, Houghton	2.00
Poe, E. A., *Complete Works*, (17 Vols.), (Virginia ed.), Crowell	21.00
Pope, A., *Poetical Works*, (Globe ed.), Macmillan	1.75
Reade, C., *The Cloister and the Hearth*, Page	1.50
Ruskin, J., *Crown of Wild Olive, Ethics of the Dust, Sesame and Lilies*, (3 Vols.), Merrill	4.50
Rosetti, D. G., *Poems*, Crowell	.75
Scott, W., *Poetical Works*, (Globe ed.), Macmillan	1.75
Scott, W., *Waverly Novels*, (12 Vols.), Estes	12.00
Shakespeare, W., *Works*, ed. by Craig, (Oxford ed.), Clarendon Press	1.50

Shakespeare, W., *Works*, ed. by Rolfe, (40 Vols.), American Book Company each $	.56
Shelley, B. P., *Poetical Works*, (Globe ed.), Macmillan	1.75
Spenser, E., *Complete Works*, (Globe ed.), Macmillan	1.75
Stevenson, R. L., (27 Vols.), Scribner	27.00
Swift, J., *Guilliver's Travels*, ed. by Scott, Bell	1.00
Swift, J., *Tale of a Tub, etc.*, ed. by Scott, Bell	1.00
Tennyson, A., *Works*, (Globe ed.), Macmillan	1.75
Swinburne, A. C., *Poems*, Crowell	1.75
(6 Vols.), Harper	12.00
Thackeray, W. M., *Complete Works*, (10 Vols.), Estes	10.00
Thomson, J., *Poetical Works*, Oxford Press	1.00
Taylor, B., *Poetical Works*, (Household ed.), Houghton	1.50
Thoreau, H., *Walden*, Houghton	3.00
Walton, I., *Complete Angler*, (Everyman's Lib.), Dutton	.35
Webster, D., *Great Speeches and Orations*, Little	3.00
Whittier, J. G., *Complete Poetical Works*, (Cambr. ed.), Houghton	2.00
Wordsworth, W., *Poetical Works*, (Globe ed.), Macmillan	1.75

TRANSLATIONS.

The Bible, (Authorized Version), "International," Winston	1.50
The Modern Reader's Bible, ed. by R. G. Moulton, Macmillan	2.00
The Odyssey, transl. by Palmer, Houghton	.75
The Iliad, transl. by Butcher and Lang, Macmillan	1.50
The Judgment of Socrates, transl. by More, (Riv. Ser.), Houghton	.15
The Divine Comedy, transl. by Longfellow, (3 Vols.), Houghton	4.50
The Song of Roland, transl. by Butler, (Riv. Ser.), Houghton	.40
Don Quixote, transl. by Matteux, (2 Vols.), Macmillan	2.00
The Nibelungenlied, transl. by Shumway, Houghton	.75
Goethe's *Faust*, transl. by Taylor, Houghton	2.50
The Rubaiyat of Omar Khayyam, transl. by Fitzgerald, Dutton	1.00
The Kalevala, transl. by Kirby, (2 Vols.), (Everyman), Dutton	.70
The Mabinogion, transl. by Lady Guest, (Everyman), Dutton	.35

The larger publishing houses, both in this country and in England, bring out new editions of the standard authors from time to time, better edited or cheaper or otherwise more desirable than those formerly offered. For this reason it has not seemed advisable in all cases to specify editions. Book-dealers are always supplied with catalogs of the important publishers.

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Winsor, *Mississippi Basin: the Struggle Between England and France*, 1697-1763, Houghton, Mifflin	4.00
*Winsor (ed.), *Narrative and Critical History of America*, (8 Vols.), Houghton, Mifflin	44.00
Winsor, *Reader's Handbook of the Revolution*, Houghton, Mifflin	1.25
*Winsor, *Westward Movement*, 1763-1798, Houghton, Mifflin	4.00
*Woodburn, *American Republic and its Government*, Putnam	2.00
*Wright, *Industrial Evolution of the United States*, Scribner	1.25

MAPS AND CHARTS.

Atkinson-Mentzer, *Charts for American History*, Atkinson, Mentzer & Grover	15.00

Foster, *Historical Maps for American History*, Rand McNally	$ 20.00
Hart, *History Aids (Charts for United States History)*, Nystrum & Co.	4.00

GENERAL REFERENCE WORKS.

As the lists given above are special in character the following general reference works of value might be mentioned as desirable in connection with history courses:

American Year Book, pub. annually, Appleton	$ 2.50
Bourne, *The Teaching of History and Civics.* (American Teachers Series), Longmans, Green	1.50
Brewer, *Historic Note Book*, Lippincott	3.50
*Century Dictionary of Proper Names, Century Co.	10.00
*Day, *History of Commerce*, Longmans	2.00
*George, *Relations of History and Geography*, Clarendon Press	1.10
Historical Sources in Schools, Macmillan	.50
History Syllabus for Secondary Schools, New England History Teachers Association, Heath	1.20
Larned, *History for Ready Reference*, (6 Vols.), (Springfield, Mass.), Nichols	30.00
New International Encyclopedia, (20 Vols.), Dodd, Mead (or other good standard encyclopedia such as the new Brittanica).	85.00
Ploetz, *Epitome of Ancient, Mediaeval, and Modern History*, ed. by Tillinghast, Houghton, Mifflin	3.00
Report of the Committee of Seven, *The Study of History in Schools*, Macmillan	.50
Statesman's Year Book, pub. annually, Macmillan Co.	3.50

CIVIL GOVERNMENT.

Note.—The most essential books are indicated by the prefix ** and present the minimum library which should be possessed by a secondary school. Books next in importance are indicated by the prefix * and every effort should be made to secure these as well as the remaining volumes in the list.

Historical works have not been included as it is assumed that these will be selected from the list of reference works for American History. Among the books in that list special attention is called to such collections as *Old South Leaflets*, Hill's *Liberty Documents* and Macdonald's *Select Charters and Other Documents Illustrative of American History*, 1606-1898.

**Ashley, R. L., *The American Federal State*, (1910), Macmillan	$ 2.00
Baldwin, Simeon E., *The American Judiciary*, (1905), Century	1.25
**Beard, Charles A., *American Government and Politics*, (1910), Macmillan	2.10
**Beard, *Readings in American Government and Politics*, (1909), Macmillan	1.90
**Bryce, James, *American Commonwealth*, (2 Vols.), (1910), Macmillan	4.00
*Cleveland, Frederick A., *The Growth of Democracy in the United States*, (Chicago, 1898), Quadrangle Press	1.50
Dole, Charles F., *The American Citizen*, (1891), Heath	.80
Ely, Richard T., *Taxation in American States and Cities*, (1888), Crowell	1.75
*Fairlie, John A., *Local Government in Counties, Towns, and Villages*, (1906), Century	1.25
Fairlie, *Municipal Administration*, (1901), Macmillan	3.00
*Fairlie, *The National Administration of the United States*, (1905), Macmillan	2.50
Finley, J. H., *The American Executive and Executive Methods*, (1908), Century	1.25
Fiske, John, *Civil Government in the United States Considered with Some Reference to Its Origin*, (1904), Houghton	1.00
*Follett, Mary Parker, *The Speaker of the House of Representatives*, (1902), Longmans	1.75
Ford, Henry Jones, *The Rise and Growth of American Politics*, (1898), Macmillan	1.50
*Goodnow, F. J., *City Government in the United States*, (1904), Century	1.25
*Harrison, Benjamin, *This Country of Ours*, (1903), Scribner	1.50
**Hart, Albert Bushnell, *Actual Government as Applied under American Conditions*, (1904), Longmans	2.00
*Hart, *Manual of History, Diplomacy, and Government of the United States*, (Cambridge, Mass., 1908), Harvard University Press	2.00
Hart, *Practical Essays on American Government*, (1893), Longmans	1.50

**Hinsdale, Burke Aaron, *The American Government, National and State*, American Book Co.	$ 1.25
**Macy, Jesse, *Our Government*, (1901), Ginn	.75
*Macy, *Party Organization and Machinery*, (1904), Century	1.25
***Official Manual of the State of Missouri*, (published biennially by the Secretary of State, Jefferson City). Free	
*Ostrogorski, M., *Democracy and the Party System in the United States*, (1910), Macmillan	1.75
*Reinsch, Paul S., *American Legislatures and Legislative Methods*, (1907), Century	1.25
*Reinsch, Paul S., *Readings in American Federal Government*, (1909), Ginn	3.30
*Roosevelt, Theodore, *American Ideals and Other Essays*, (1902), Putnam	1.50
Rowe, L. S., *Problems of City Government*, (1908), Appleton	1.50
Smith, J. Allen, *The Spirit of American Government*, (1907), Macmillan	1.25
**Statistical Abstract of the United States*, (published annually by the Bureau of Statistics, Department of Commerce and Labor, Washington). Free.	
*Stimson, F. J., *The American Constitution*, (1908), Scribner	1.25
United States Civil Service Commission, (Annual Report), (Washington).	
*Willoughby, W. F., *Territories and Dependencies of the United States*, (1905), Century	1.25
**Willoughby, W. W., *Rights and Duties of American Citizenship*, (1898), American Book Co.	1.00
*Willoughby, W. W., *The American Constitutional System*, (1904), Century	1.25
*Wilson, Woodrow, *The State*, (1902), Heath	2.00
*Wilson, *Congressional Government*, (1900), Houghton	1.25
Woodburn, J. A., *The American Republic and Its Government*, (1903), Putnam	2.00
*Zeublin, Charles, *American Municipal Progress*, (1903), Macmillan	1.25

GREEK AND LATIN.

EDITIONS, TRANSLATIONS AND SPECIAL WORK.

GREEK.

Note.—The asterisk indicates that the book is especially valuable.

Aeschylus, *The Tragedies*, ed. with English Commentary by F. A. Paley, (4th ed., 1879), Macmillan	$ 2.75
Aeschylus, *The Tragedies*, trans. by E. H. Plumptre, (1890), Heath	1.25
Aeschylus, *The Tragedies*, trans. by Stewart Blackie, (Everyman's), Dutton	.35
Autenveith, G., *Homeric Dictionary*. American Book Co.	1.10
Demosthenes, *Orations*, trans. by C. R. Kennedy, (5 Vols.), (1906), (London) Geo. Bell	5.00
Euripides, *The Tragedies*, trans. by various authors, (2 Vols.), (Everyman's), Dutton	.70
Euripides, *The Tragedies*, with English commentary by F. W. Paley, (2nd ed.), (3 Vols.), (London) Whitaker	6.00
Euripides, *The Tragedies*, trans. by A. S. Way, (3 Vols.), Macmillan	6.00
Hessiod, trans. by G. A. Elton, (1894), (London) Geo. Routledge & Sons	.50
Homer, *Iliad*, ed. by Walter Leaf, (2nd ed.), (2 Vols.), (1902), Macmillan	6.00
Homer, *Odyssey*, ed. with English notes by Merry and Ridell, (Bks. I-XII), (2nd Ed.), (Oxford) Clarendon	4.00
Homer, *Odyssey*, (Bks. XIII-XXIV); ed. with English notes by D. B. Munro, (1901), (Oxford) Clarendon	4.00
Homer, *Die Homerischen Hymnen*, text ed. by Bemoll, (1886), (Leipzig) Teubner	1.25
Homer, *Iliad*, trans. by Lang, Leaf and Myers, (1903), Macmillan	.80
Homer, *Odyssey*, trans. by F. H. Palmer, (1895), Houghton	1.50
Homer, *Homeric Hymns*, trans. by Andrew Lang, (1899), Longmans	2.00
Homer, *Odyssey*, trans. by Butcher and Lang, Macmillan	.80
Herodotus, with commentary by J. W. Blakesley, (2 Vols.), Macmillan	4.50

Herodotus, translated by G. C. Macauley, (2 Vols.), (1890), Macmillan	$ 4.50
Hesiod, ed. with English commentary by F. A. Paley, (2nd Ed.), Macmillan	1.75
Lucian, trans. by H. W. and F. G. Fowler, (4 Vols.), (1905), Oxford	3.50
Monro, D. B., *A Grammar of the Homeric Dialect*, Oxford Univ. Press	3.50
Theocritus, *Idyls*, trans. by J. H. Hallard, (1894), (London) Longmans	1.65
Theophrastus, *Characters*, text and trans. by R. C. Jebb, (1909), (London) Macmillan	1.65
Sophocles, *The Tragedies*, trans. by Sir George Young, (Everyman's), Dutton	.35
Sophocles, *The Tragedies*, edited with English notes by L. Campbell, (2 Vols.), (Oxford) Clarendon Press	8.00
Sophocles, *The Tragedies*, trans. by E. H. Plumptre, (1882), Heath	1.25
The New Testament in the Original Greek, ed. by Westcott and Hort, (2 Vols.), Macmillan	4.00
Thucydides, trans. by B. Jowett, (2 Vols.), (1881), (Oxford) Clarendon	3.75
Xenophon, trans. by H. G. Dakyns, (4 Vols.), (1890-97), Macmillan	8.75

LATIN.

Caesar.

Allen, J. H., and Greenough, J. B., *Caesar's Gallic War*, (revised edition), Ginn	1.25
Bennett, C. E., *Caesar's Gallic War*, Allyn and Bacon	1.00
*Dodge, Theodore A., *Caesar: A History of the Art of War among the Romans*, Houghton	5.00
Fowler, William Warde, *Julius Caesar and the Foundation of the Roman Imperial System*, Putnam	1.50
*Froude, James Anthony, *Caesar: a Sketch*, Appleton	1.25
*Hodges, A. T., *Caesar's Gallic War*, Macmillan	1.25
Holmes, R. T., *Caesar's Conquest of Gaul*, Macmillan	6.50
Judson, H. P., *Caesar's Army*, Ginn	1.00
Kelsey, F. W., *Caesar's Gallic War*, Allyn and Bacon, Appleton	1.10
Napoleon III, Emperor of France, *History of Julius Caesar*, Harper	5.00
Trollope, A., *Commentaries of Caesar*, Lippincott	.50

Walker, A. T., *Caesar's Gallic War*, Scott, Foresman	$ 1.25
Westcott, J. H., *Caesar's Gallic War*, Appleton	1.25
Cicero.	
Allen, J. H., and Greenough, J. B., *Orations and Letters of Cicero*, (revised edition), Ginn	1.30
Bennett, C. E., *Orations of Cicero*, Allyn and Bacon	1.25
Boissier, Gaston, *Cicero and his Friends.* (translation), (London) Ward, Lock	1.25
Collin, W. L., *Cicero*, Lippincott	.50
Forbes, Charles H., *Cicero's Orations*, Appleton	1.40
*Forsyth, William, *Life of Marcus Tullius Cicero*, Scribner	2.60
Johnston, A. W., and Kingery, H. M., *Orations of Cicero*, Scott, Foresman	1.25
Kelsey, Francis W., *Orations and Letters of Cicero*, Allyn and Bacon	1.25
Minkwitz, R. A., *Cicero's Oration and Letters*, Macmillan	1.25
*Strachan-Davidson, James Leigh, *Cicero and the Fall of the Roman Republic*, Putnam	1.50
Trollope, Anthony, *The Life of Cicero*, Harper	3.00
Eutropius.	
Welch, and Duffield, *Eutropius*, Macmillan	.40
Nepos.	
Barss, J. E., *Nepos; Lives*, Macmillan	.90
Chase, G. D., *Nepos; Lives*, Appleton	1.00
Roberts, A. W., *Nepos; Lives*, Ginn	.75
Ovid.	
Bain, C. W., *Selections from Ovid*, Macmillan	1.10
Fowler, Harold N., *Selections from Ovid*, Ginn	1.10
Gleason, C. W., *A term of Ovid*, American Book Co.	.75
Laing, G. J., *Selections from Ovid*, Appleton	1.40
Sallust.	
Greenough, J. B., and Daniel, M. S., *Catiline*, Ginn	.90
Gudeman, A., *Catiline*, Appleton	1.00
Brooke, W. P., *Jugurtha*, Longman	.65
Herbermann, Charles G., *Catiline*, Sanborn	.90
Vergil.	
Bennett, C. E., *Aeneid*, Allyn and Bacon	1.20
Carter, J. R., *Aeneid*, Appleton	1.40
Comparetti, *Vergil in the Middle Ages*, Macmillan	2.50
*Church, A. J., *Stories from Vergil*, Dodd, Mead	1.25
Collins, W. L., *Vergil*. Lippincott	.50

Comstock, E. Y., *Aeneid*, Allyn and Bacon ....$	1.40
*Conington, John, *Complete Works of Vergil*, (3 Vols.), (London) Geo. Bell & Son	7.90
*Conington, *Translation of the Aeneid*, Longman........	.65
Fairclough, H. R., *Aeneid*, Sanborn	1.40
Frieze, H. S., and Dennison, W., *Aeneid*, American Book Co.	1.50
Glover, T. R., *Studies in Vergil*, (London) Edward Arnold	2.65
Greenough, J. B., *Georgics and Aeneid* (Books VII-XII), Ginn	1.12
Greenough, J. B., and Kitridge, G. L., *Aeneid* (Books I-VI), and *Bucolics*, Ginn	1.60
*Howard, J. H., *Quantitative Reading of Latin Verse*, Scott, Foresman	.25
*Johnston, H. W., *Metrical Licenses of Vergil*, Scott, Foresman	.50
Knapp, Charles W., *Aeneid*, Scott, Foresman	1.40
Lonsdale and Lee, *Translation of the Aeneid*, Macmillan	1.25
Miller, F. J., *Two Dramatizations from Vergil*, University of Chicago Press	1.08
*Morris, William, *Translation of the Aeneid*, Longmans..	2.00
*Nettlership, Henry, *Ancient Lives of Vergil*, Macmillan..	.50
*Nettlership, Henry, *Lectures and Essays*, Macmillan....	1.90
*Sellar, W. Y., *Roman Poets of the Augustan Age; Vergil*, (London) Clarendon Press	2.25
Sidgwick, A., *Complete Works of Vergil*, (2 Vols.), Cambridge University Press	1.90

Viri Romae.

Churchill, M. E., and Sanford, F. W., *Viri Romae*, Scott, Foresman	.75
D'Ooge, B. L., *Viri Romae*, Ginn	.75
Rolfe, J. C., *Viri Romae*, Allyn and Bacon	.75

GRAMMARS AND DICTIONARIES.

GREEK.

Blass, Fr., *Pronunciation of Ancient Greek*, trans. by W. J. Purton, (1893), Macmillan	1.90
Goodwin, W. W., *Syntax of the Moods and Tenses of the Greek Verb*, (1893), (Boston) Ginn	2.00
Hadley and Allen's *Greek Grammar*, American Book Co..	1.50

Liddell and Scott, *Greek-English Lexicon*, (7th ed.), (1886), Harper	$ 10.00
Pizo-Rangabe, E., *A Practical Method in the Modern Greek Language*, (1896), Ginn	2.00
Veitch, Wm., *Greek Verbs Irregular and Defective*, (1887), Oxford University	2.50

LATIN.

*Allen, J. H., and Greenough, J. B., *New Latin Grammar*, Ginn	1.20
*Bennett, C. E., *The Latin Language*, Allyn and Bacon	1.00
*Bennett, C. E., *Latin Grammar*, Allyn and Bacon	.80
*Gildersleeve, B. L., *Latin Grammar*, revised edition, University Publishing Co.	1.20
*Hale, W. G., and Buck, C. D., *Latin Grammar*, Ginn	1.00
Hale, W. G., *Syntax of Latin Moods and Tenses*, Ginn	1.50
*Harkness, A., *Latin Grammar*, American Book Co.	1.12
*Lane, George, *Latin Grammar*, revised by Morgan, M. H., American Book Co.	1.50
*Lewis, C. T., and Short, C., *Harpers' Latin Dictionary*, American Book Co.	6.50
Lewis, C. T., *Elementary Latin Dictionary*. American Book Co.	2.00
*Lord, F. E., *Roman Pronunciation of Latin*, Ginn	.35
Roby, H. J., *Grammar of the Latin Language*, (2 Vols.), Macmillan	4.60
Shumway, E. S., *Handbook of Latin Synonyms*, Ginn	.30
*Smith, W., and Hall, T. D., *English-Latin Dictionary*, American Book Co.	4.00
*West, A. F., *Latin Grammar*, Appleton	.90

HISTORY, MYTHOLOGY AND RELIGION.

GENERAL.

*Bulfinch, J., *The Age of Fable*, (London) Lee and Shepard	1.25
Collignon, M., *Manual of Mythology*, trans. by J. E. Harrison, (London) Gravel & Co.	1.90
*Gayley, C. M., *Classic Myths*, Ginn	1.50
Guerber, H. A., *Myths of Greece and Rome*, (1893), American Book Co.	1.50
*Harrington and Tolman, *Greek and Roman Mythology*, Sanborn	1.00

*Keightley, Thos., *Mythology of Ancient Greece and Italy*, 4th ed. edited by Leonhard Schmitz, (1880), (London) Geo. Bell	$ .75
*Murray, A. S., *Manual of Mythology*, Scribner	1.25

GREEK.

*Botsford, G. W., *History of the Orient and Greece*, Macmillan	1.20
Bury, J. B., *A History of Greece*, Macmillan	1.75
Cox, G. W., *The Athenian Empire*, (5th Ed.), (1887), Scribner	1.00
*Fairbanks, A., *Handbook of Greek Religion*, (1910), American Book Co.	1.50
Fiske, J., *Myths and Mythmakers*, (1900), Houghton	2.00
Gardner, P., *New Chapters in Greek History*, (1892), Putnam	5.00
Holm, A., *History of Greece*, (4 Vols.), (1898-1900), Macmillan	10.00
Lang, A., *Myth Ritual and Religion*, (2 Vols.), Longmans	2.50
Mahaffy, J. P., *The Greek World Under Roman Sway*, (1890), Macmillan	3.00
Oman, C. W. C., *History of Greece*, (1892), Longmans	1.50

LATIN.

*Botsford, S. W., *History of Rome*, Macmillan	1.10
*Capes, W. W., *The Age of the Antonines*, Longmans	1.10
*Capes, W. W., *The Early Empire*, Longmans	1.10
Gibbon, Edward, *The Decline and Fall of the Roman Empire*, (6 Vols.), Macmillan	14.00
*Howe, W. W., and Leigh, H. D., *History of Rome to the Death of Caesar*, Longmans	2.00
*Ihne, William, *Early Rome*, Scribner	1.00
*Merivale, Charles, *The Roman Triumvirates*, Longmans.	1.00
*Merivale, Charles, *History of the Romans under the Empire*, (8 Vols.), Longmans	10.00
Mommsen, Th., *The Provinces of the Roman Empire*, (2 Vols.), Scribner	6.00
*Mommsen, Th., *History of Rome*, (5 Vols.), Scribner	10.00
Pelham, H. F., *Outlines of Roman History*, Putnam	1.75

BOOKS OF REFERENCE, HANDBOOKS, ETC.

GENERAL.

*Baumeister, A., *Bilder aus dem griechischen und römischen Altertum*, (Munich) R. Oldenbourg	$ 3.00
Coulanges, Fustel de., *The Ancient City*, (London) Lee and Shepard	1.60
*Gow, J. A., *Companion to School Classics*, Macmillan	1.75
*Guhl, E., and Koner, W., *Life of the Greeks and Romans Described from Antique Monuments*. Appleton	2.50
*Kiepert, H., *Atlas Antiquus*, Sanborn	1.25
Marquand, A., and Frothingham, A. L., *Text Book of the History of Sculpture*, Longmans	1.50
*Mau, A., *Pompeii, its Life and Art*, translated by Kelsey, Macmillan	6.00
*Peck, H. T., *Harper's Dictionary of Classical Literature and Antiquities*, American Book Co.	6.00
*Rich, A., *Dictionary of Roman and Greek Antiquities*, Longmans	2.50
*Schreiber, Th., *Atlas of Classical Antiquities*, Macmillan	6.50
*Seyffert, O., *Dictionary of Classical Antiquities*, Macmillan	3.00
Smith, W., *Dictionary of Greek and Roman Antiquities*, (2 Vols.), Little, Brown & Co.	14.00
Smith, W., *Dictionary of Greek and Roman Geography*, (2 Vols.), Little, Brown & Co.	12.00
Smith, W., *Dictionary of Greek and Roman Biography and Mythology*, (3 Vols.), Little, Brown & Co.	18.00
*Tozer, H. F., *Classical Geography*, American Book Co.	.35

GREEK.

Baedeker, K., *Greece*, (1901), (4th revised), (Leipzig) Karl Baedeker	2.50
Becker, W. A., *Charicles, or Illustrations of the Private Life of the Ancient Greeks*, (1899), Longmans	2.50
Bluemner, H., *Home Life of the Ancient Greeks*, (1895), Cassell	2.00
Engelmann, R., and Anderson, W. C. F., *Pictorial Atlas to Homer's Iliad and Odyssey*, (1892), (London)	3.00
Gardner, P., and Jevons, F. B., *A Manual of Greek Antiquities*, (1895), Scribner	4.00
Gulick, C. B., *Life of the Ancient Greeks*, (1902), Appletons	1.40

Mahaffy, J. P., *Social Life in Greece*, (1898), (London) Macmillan	$ 1.75
Mahaffy, J. P., *Greek Life and Thought*, (1896), Macmillan	3.00
*Tucker, T. G., *Life in Ancient Athens*, (1906), Macmillan	1.25

LATIN.

Abbott, F. F., *Society and Politics in Ancient Rome*, Scribner	1.25
*Becker, W. A., *Gallus*, Longmans	2.50
Church, A. J., *Roman Life in the Days of Cicero*, Macmillan	.50
Fowler, W. W., *Social Life at Rome in the Age of Cicero*, Macmillan	2.25
Inge, W. R., *Society in Rome under the Caesars*, Scribner	1.25
Johnston, H. W., *The Private Life of the Romans*, Allyn and Bacon	1.50
Lanciani, R., *Ancient Rome in the Light of Recent Discoveries*, Houghton, Mifflin	6.00
Lanciani, R., *The Ruins and Excavations of Ancient Rome*, Houghton, Mifflin	4.00
*MacKail, J. W., *Latin Literature*, Scribner	1.25
Platner, Samuel B., *Ancient Rome*, Allyn and Bacon	3.00
*Preston, H. W., and Dodge, L., *Private Life of the Romans*, Sanborn	1.25
Ramsay, W., *Manual of Roman Antiquities*, Scribner	3.00
*Tucker, T. G., *Life in the Ancient World of Nero and St. Paul*, Macmillan	2.50

GERMAN.

FOR CLASS-ROOM READING.

SUITABLE FOR THE FIRST AND SECOND UNITS.

Allen, *Herein!* Holt	.75
Anderson, *Bilderbuch ohne Bilder*, Holt	.30
Anderson, *Die Eisjungfrau*, Holt	.30
Anderson, *Märchen*, Heath	.70
Auerbach, *Brigitta*, Ginn	.50
Bacon, *Im Vaterland*, Allyn & Bacon	1.00
Baker, *German Stories*, Holt	.30
Baumbach, *Sommermärchen*, Holt	.25
Baumbach, *Waldnovellen*, Heath	.30

Baumbach, *Nicotiana*, Heath	$ .25
Bernhardt, *Aus Herz und Welt*, Heath	.25
Betz, *Till Eulenspiegel*, Heath	.25
Burkhard, *German Poems for Memorizing*, Holt	.30
Carruth, *A German Reader*, Ginn	.50
Frommel, *Eingeschneit*, Heath	.25
Frommel, *Mit Ränzel und Wanderstab*, Heath	.30
Gerstacker, *Germelshausen*, American Book Co.	.25
Grimm, *Märchen*, American Book Co.	.45
Guerber, *Märchen und Erzählungen*, I & II, Holt	.65
Harris, *German Reader*, Holt	1.00
Hauff, *Die Karawane*, Holt	.75
Hauff, *Das Kalte Herz*, Heath	.40
Hauff, *Der Zwerg Nase*, Heath	.15
Hewett, *A German Reader*, Macmillan	1.25
Heyse, *L'Arrabbiata*, Heath	.25
Heyse, *Das Mädchen von Treppi*, Heath	.30
Heyse, *Die Blinden*, Holt	.30
Heyse, *Anfang und Ende*, Holt	.30
Krüger and Smith, *English-German Conversation Book*, Heath	.30
Leander, *Träumereien*, Holt	.30
Nichols, *Easy German Reader*, Holt	.35
Petersen, *Prinzessin Ilse*, Holt	.80
Pope, *German Composition*, Holt	.90
Riehl, *Burg Neideck*, Ginn	.30
Riehl, *Das Spielmannskind*, Heath	.25
Ries, *Easy German Reader*, American Book Co.	.30
Schrakamp, *Ernstes und Heiteres*, American Book Co.	.30
Seeligmann, *Altes und Neues*, Ginn	.35
Seidel, *Aus goldenen Tagen*, Heath	.35
Stern, *Geschichten vom Rhein*, American Book Co.	.85
Stern, *Geschichten von deutschen Städten*, American Book Co.	1.25
Stifter, *Das Haidedorf*, Heath	.20
Storm, *Geschichten aus der Tonne*, Ginn	.60
Storm, *Auf der Universität*, Holt	.35
Storm, *Der Schimmelreiter*, Ginn	.50
Storm, *Immensee*, Holt	.25
Storm, *Im Sonnenschein*, American Book Co.	.30
Thomas and Harvey, *German Reader*, Holt	1.00
Wildenbruch, *Das edle Blut*, Holt	.30
Zschokke, *Abenteuer der Neujahrsnacht*, Holt	.25

Zschokke, *Das Wirtshaus zu Cransac*, Heath	$ .25
Zschokke, *Der verbrochene Krug*, Heath	.25

SUITABLE FOR THIRD UNIT.

Benedix, *Der Prozesz*, Heath	.20
Benedix, *Die Hochzeitsreise*, Heath	.25
Chamisso, *Peter Schlemihl*, Holt	.25
Droste-Hülshoff, *Die Judenbuche*, Oxford University Press	.65
Eichendorff, *Aus dem Leben eines Taugenichts*, Holt	.40
Fouqué, *Undine*, American Book Co.	.50
Freytag, *Die Journalisten*, Holt	.50
Freytag, *Aus dem Jahrhundert des groszen Kreiges*, Heath	.50
Freytag, *Doktor Luther*, Ginn	.50
Freytag, *Karl der Grosze*, Holt	.50
Fulda, *Der Dummkopf*, Holt	.30
Fulda, *Der Talisman*, Heath	.30
Goethe, *Dichtung und Wahrheit*, Holt	.70
Goethe, *Hermann und Dorothea*, Ginn	.70
Gutzkow, *Uriel Acosta*, Holt	.30
Hauff, *Lichtenstein*, Holt	.60
Heine, *Poems*, Ginn	.70
Heine, *Harzreise*, Ginn	.50
Helbig, *Komödie auf der Hochschule*, Heath	.30
Klenze, *Deutsche Gedichte*, Holt	.90
Lessing, *Minna von Barnhelm*, Macmillan	.50
Manley and Allen, *Four German Comedies*, Ginn	.45
Moser, *Köpnickerstrasse*, Heath	.30
Moser, *Der Bibliothekar*, Holt	.40
Rosegger, *Waldheimat*, Ginn	.30
Rosegger, *Die Schriften des Waldschulmeisters*, Holt	.25
Scheffel, *Der Trompeter von Säkkingen*, Macmillan	.75
Schiller, *Thirty Years' War*, Holt	.60
Schiller, *Ballads*, Heath	.60
Schiller, *Die Glocke*, Holt	.25
Schoenfeld, *German Historical Prose*, Holt	.70
Schuecking, *Die Drei Freier*, Ginn	.30
Sudermann, *Frau Sorge*, Heath	.40
Sudermann, *Der Katzensteg*, Heath	.40
Sybel, *Die Erhebung Europas*, Ginn	.40
Tieck, *Die Elfen*, Holt	.20
Uhland, *Poems*, Macmillan	1.25
Vos, *Wilhelm Tell*, Ginn	.90

For Reference.

Vietor, Wilhelm, *German Pronunciation*, (Leipzig) Reisland	$ .50
Flügel-Schmidt-Tanger, *Dictionary of the English and German Languages*, (Braunschweig) Westermann	4.00
James, *German and English Dictionary*, Macmillan	1.50
Kluge, *Deutsches etymologisches Wörterbuch*, (7 Auflage), (Strassburg) Trübner, (in German)	3.00

GENERAL REFERENCE.

Duden, K., *Orthographisches Wörterbuch der deutschen Sprache*, (in German), (last edition), (Leipzig) Bibliographisches Institut	.35
Eberhard, Joh. A., *Synonymisches Handwörterbuch der deutschen Sprache*, (in German), (17th Ed.), (Leipzig) Grieben	2.80
Francke, H., *History of German Literature*, (1901), Holt	2.50
Robertson, John A., *A History of German Literature*, (1902), Putnam	3.50
Scherer, W., *History of German Literature*, (1892), Scribner	3.50
Könnecke, G., *Bilderatlas zur Geschichte der deutschen National-Litteratur*, (in German), (3d Ed.), (Marburg) Elwert	6.50
Curme, Geo. O., *A Grammar of the German Language*, Macmillan	4.00
Bagster-Collins, E. W., *The Teaching of German in Secondary Schools*, (1904), The Columbia University Press	1.50
Report of the Committee of Twelve, Heath	.20

FRENCH.

Most of the books mentioned as desirable are published in France. They can best be ordered through A. Picard et Fils, Libraires, No. 82, Rue Bonaparte, Paris. This is the best firm at Paris for ordering foreign books. One should always order directly from abroad, since American dealers at New York and elsewhere ask from 20 per cent to 50 per cent more than this and other good foreign firms. Books are sent by mail or freight, and the money is forwarded by postoffice money order.

Edgren-Burnet, *French and English Dictionary*, Holt	$ 1.50
Hatzfield-Darmsteter, *Dictionary*, (2 Vols.), (Paris) Delagrave	40 francs
International French-English Dictionary, Hinds & Noble	$ 3.00
(This dictionary is invaluable because of its having the pronunciation of all words given in phonetic spelling.)	
Le Petit Larousse, (1 Vol.)	6.50
Skeat's *Etymological Dictionary*, Clarendon Press	11.00
(This dictionary is invaluable for showing the relationship between French and English words.)	
Fortier, *Hist. de la Littérature Française*, Holt	1.00
Lanson, *Hist. de la Lit. Française*, (Paris) Hachette	7 francs
Pellissier, *Précis de l'Histoire de la Lit. Française*	4 francs
Brachet-Toynbee, *Historical French Grammar*, Clarendon Press	$ 2.00
Parton, *French Parnassus*, Houghton, Mifflin	1.50
L'Echo des Deux Mondes, a monthly journal, (Chicago) A. C. Babize & Co., per year	1.50

A maximum equipment should of course include all or nearly all of the volumes just mentioned. In addition, the following suggestions are made:

Petit de Julleville, *Hist. de la Langue et de la Lit. Française*, (8 Vols.), (Paris) Armand Colin	126 francs
Nyrop, *Grammaire Historique de la Langue Française*, (2 Vols.), (1904), (Paris)	15 francs
Le Maître Phonétique, the best journal for the study of accurate speech, not only in French but in all the more important modern languages. (Address: Rue de la Madeleine, Bourg-la-Reine, Seine, France), per year	5 francs
Revue des Deux Mondes, Paris, bi-monthly, per year	62 francs
Matzke, *French Pronunciation*, 2d edition, is very useful, Holt	$ .25
Michaelis-Passy, *Dict. Phonétique Française*, (Paris) Le Soudier	5 francs
Passy, P., *Le Français Parlé*, (Leipzig) Reisland	2.50 francs
Passy, *Les Sons du Français*, (Paris) Didot	1.50 francs
Rambeau-Passy, *Chrestomathie Phonétique*, (Paris) Le Soudier	6 francs

One of the most desirable aids to a correct pronunciation is the phonograph. A teacher can not possibly give all the time necessary to secure good pronunciation in an average class, but this machine proves an admirable substitute, when conscientiously and continuously used. The best company that sells or leases phonographs and the necessary disks for the study of a modern language is the United States School of Languages, 1127-29 Walnut St., Philadelphia, Pa. A machine with a set of elementary disks and the corresponding text can be bought for about $45. The set of advanced records costs $10, and a third set of difficult French words costs $5. The same school also has sets of records for Spanish.

A library should of course contain a considerable number of the standard works of French literature. It would be too great a task to attempt to name any special authors or books.

SPANISH.

In addition to a collection of the standard authors and a phonograph with disks, the following brief list of desirable volumes may be given:

Diccionario de la Real Academia, (Madrid) Hernando (Double the price here given if not paid in advance; postage extra.)	25 pesetas
Velásquez de la Cadena, *Diccionario Esp. Inglés*. (2 Vols.), Appleton ......$	6.00
Of smaller and cheaper dictionaries, Appleton's *New Spanish Dictionary* will be found usable	2.00
Fitzmaurice-Kelly, *History of Spanish Lit.* (For beginners, the English edition; for advanced classes, the more complete edition; translated by Bonilla y San Martin), (Madrid) Espana Moderna	10 pesetas
Hume, *Modern Spain*, (Nations Series), (London) Unwins ....$	1.25

PHYSICS.

Ames, J. S., *Text-book of General Physics*, (1904), American Book Co. ....$	1.60
Aryton, W. E., *Practical Electricity*, (1900), Cassell......	2.00
Boys, C. V., *Soap Bubbles*, (1900), (London) S. P. C. K.	.50
Cajori, F. F., *History of Physics*, (1899), Macmillan....	1.60
Derr, *Photography for Students of Physics and Chemistry*, Macmillan	1.40
Duff, A. W., *Text-book of Physics*, (1909), Blakiston....	2.75
Edser, E., *Light for Students*, (1903), Macmillan........	1.50

Edser, E., *Heat for Advanced Students*, (1901), Macmillan	$ 1.00
Everett, J. D., *C. G. S. System of Units*, (1891), Macmillan	1.25
Forbes, G., *Course of Lectures on Electricity*, (1888), (London) Longmans	1.00
Ganot, A., *Elementary Treatise on Physics*, 17th ed., (1906), Longmans	2.50
Glazebrook, R. T., *Mechanics and Hydrostatics*, Macmillan	2.50
Glazebrook, R. T., and Shaw, W. N., *Practical Physics*, (4th ed.), (1893), (London) Longmans	2.50
Hastings, *Light*, Scribner	2.50
Houston and Kennelly, *Elementary Electrical Series*, (10 Vols.), *Magnetism*, *The Electric Motor*, *The Electric Telegraph*, *The Electric Telephone*, *Electric Street Railways*, etc., (New York) McGraw and Hill, per volume	1.00
Larden, W., *Electricity*, Longmans	1.75
Maxwell, J. C., *Theory of Heat*, (1897), (London) Longmans	1.50
Michelson, *Light Waves and their Uses*, University of Chicago Press	2.00
Miller, D. C., *Laboratory Physics*, (1903), Ginn	2.00
Nichols, E. L., *Laboratory Manual of Physics*, (Vol. 1), Macmillan	3.00
Perry, J., *Spinning Tops*, (1901), (London) S. P. C. K.	.50
Poyser, A. W., *Magnetism and Electricity*, Longmans	1.50
Stewart, B., and Gee, W. W., *Lessons in Elementary Practical Physics*, (1 Vol.), (1898), Macmillan	1.50
Taylor, Sedley, *Sound and Music*, (London) Macmillan	2.25
Thomas, J. J., *Electricity and Matter*, (1904), Scribner	1.25
Thompson, S. P., *Elementary Lessons in Electricity and Magnetism*, (1892), Macmillan	1.40
Thompson, S. P., *Light, Visible and Invisible*, (1897), Macmillan	1.50
Tyndall, J., *Heat as a Mode of Motion*, (1895), Appleton	2.50
Tyndall, J., *Sound*, (1895), Longmans	2.00
Watson, W., *Text-book on Physics*, Longmans	3.50
Wood, R. W., *Physical Optics*, (1905), Macmillan	3.50
Wright, L., *Optical Projection*, Longmans	2.25
Zahm, J. A., *Sound and Music*, (1892), McClurg	3.00

CHEMISTRY.

Armitage, F. A., *History of Chemistry*, (1906), Longmans	1.60
Bailey, E. H. S., *Sanitary and Applied Chemistry*, (1906), Macmillan	1.40
Dobbin, L., and Walker, J., *Chemical Theory for Beginners*, Macmillan	.70
Duncan, R. K., *The Chemistry of Commerce*, (1907), Harper	2.00
Faraday, M., *Chemical History of a Candle*, Harper	.85
Holleman, A., *Organic Chemistry*, Wiley	2.50
Lassar-Cohn, *Chemistry in Daily Life*, Lippincott	1.50
Meyer, E. von, *History of Chemistry*, (1898), Macmillan	4.50
Newth, G. S., *Text-book of Inorganic Chemistry*, (1894), Longmans	1.75
Olsen, *Quantitative Analysis*, Van Ostrand	4.00
Ostwald, W., *Conversations in Chemistry*, (1905), (N. Y.) Wiley	1.50
Picton, H. W., *Story of Chemistry*, (1892), (London) Isbister	.85
Ramsay, W., *Gases of the Atmosphere*, (1896), Macmillan	1.50
Reychler, A., *Outlines of Physical* Chemistry, Macmillan	1.00
Roscoe, H. E., *Life and Experiences*, (1906), Macmillan	4.00
Smith, A., *General Inorganic Chemistry*, (1906), Century	2.25
Snyder, H., *Chemistry of Plant and Animal Life*, (1903), Macmillan	1.40
Snyder, H., *Chemistry of Soils and Fertilizers*, (1899), (Easton) Chemical Pub.	1.50
Sutton, *Volumetric Analysis*, Blakiston's Son. (In press.)	
Thompson, S. P., *Michael Faraday: Life and Work*, (1898), Macmillan	1.25
Thorp, F. H., *Industrial Chemistry*, Macmillan	3.75
Thorpe, T. E., *Essays in Historical Chemistry*, Macmillan	4.00
Treadwell-Hall, (Vol. I), *Qualitative Analysis*, Wiley	3.00
Treadwell-Hall, (Vol. II), *Quantitative Analysis*, Wiley	4.00

GENERAL BIOLOGY, BOTANY AND ZOOLOGY.

GENERAL BIOLOGICAL REFERENCES.

Bateson, W., *Mendel's Principles of Heredity*, Putnam	3.50
Bower, F. O., *The Origin of a Land Flora*, (1908), Macmillan	5.50
Darwin, C., *Origin of Species*, (1892), Appleton	2.00

Davenport, E., *Principles of Breeding*, (1908), Ginn	$ 2.50
Hertwig, R., *General Principles of Zoology*, (1897), Holt	1.60
Hodge, C. F., *Nature Study and Life*, (1902), Ginn	1.50
Jordan and Kellogg, *Evolution and Animal Life*, Appleton	2.50
Kerner, A., von M., *Natural History of Plants*, tr. by F. W. Oliver, (2 Vols.), (1895), Holt	15.00
Metcalf, M. M., *Outline of the Theory of Organic Evolution*, (1904), Macmillan	2.50
Punnett, R. C., *Mendelism*, (1909), (N. Y.) Wiltshire Book Co.	.50
Romanes, G. J., *Darwin and After Darwin*, (2 Vols.), Vol. I—*The Darwinian Theory*, (1892), (Chicago) Open Court	2.00
Sedgwick, W. T. & Wilson, E. B., *General Biology*, (2d ed.), (1895), Holt	1.75
Thomson, J. A., *Heredity*, (1908), Putnam	3.50
Wallace, A. R., *Darwinism*, (1890), Macmillan	1.75

The teacher should have access to the following:

Lloyd, F. E., and Biglow, M. A., *The Teaching of Biology in the Secondary School*, (1904), Longmans	1.50
Nature-study Review: A Journal Devoted to all Phases of Nature-study in Elementary Schools, 41 North Queen St., Lancaster, Pa. Per Vol. (6 nos.)	1.00

BOTANY.

ELEMENTARY TEXTS AND REFERENCE BOOKS.

Atkinson, G. F., *Elementary Botany*, rev. ed., (1905), Holt	1.50
Atkinson, G. F., *Botany for High Schools*, (1910), Holt.	1.25
Bailey, L. H., *Lessons with Plants*, (1898), Holt	1.10
Bailey, L. H., *Garden Making*, Macmillan	1.00
Barnes, C. R., *Outlines of Plant Life*, (1900), Holt	1.10
Bergen, J. Y., *Elements of Botany*, rev. ed., (1904), Ginn	1.30
Bergen, J. Y., and Davis, B. M., *Principles of Botany*, (1906), Ginn	1.50
Caldwell, O. W., *Handbook of Plant Morphology*, (1904), Holt	1.00
Coulter, J. M., *A text-book of Botany*, (1906), Appleton	1.25
Coulter, J. M., *Plants—A Text-book of Botany*, (1901), Appleton	1.25
Coulter, J. M., Barnes, C. R., and Cowles, H. C., *A Text-book of Botany*, (1910), American Book Co.	3.50

Duggar, B. M., *Fungous Diseases of Plants*, (1909), Ginn.	$ 2.00
Leavitt, R. G., *Outlines of Botany*, (1901), American Book Co.	1.00
Lipman, J. G., *Bacteria in Relation to Country Life*, 2nd ed., (1909), Macmillan	1.50
MacDougal, D. T., *Experimental Plant Physiology*, (1898), Holt	1.00
Peirce, G. J., *A Text-book of Plant Physiology*, (1903), Holt	2.00
Pinchot, G., *A Primer of Forestry*, Bul. 24, Bureau of Forestry, (Washington)	
Robinson, B. L., and Fernald, *Gray's New Manual of Botany*, (7th edition), (1908), American Book Co.	2.50
Schimper, A. F. W., *Plant Geography*, tr. by Fischer, (1903), Oxford Press	12.75
Strasburger, E., Noll, F., Schenck, H., and Karston, G., *A Text-book of Botany*, 3rd Eng. edition, translated by W. H. Lang, (1908), Macmillan	5.00

The following should be added to the above list if possible:

ADDITIONAL TEXTS, FLORAS, AND APPLIED WORKS.

Andrews, E. F., *Botany All the Year Round*, (1903), American Book Co.	$ 1.00
Arthur, J. C., and MacDougal, D. T., *Living Plants and Their Properties*, (1898), Holt	1.25
Atkinson, G. F., *College Botany*, (1905), Holt	2.00
Atkinson, G. F., *Studies of American Fungi: Mushrooms—Edible, Poisonous, etc.*, (1900), (Ithaca) Andrus & Church	3.00
Bailey, L. H., *Survival of the Unlike*, (1896), Holt	2.00
Bailey, L. H., *Plant Breeding*. (1906), Macmillan	1.00
Bergen, J. Y., *Foundations of Botany*, Ginn	1.50
Britton, N. L., *N. A. Trees*, (1908), Holt	7.00
Campbell, D. H., *Mosses and Ferns*, (1905), Macmillan	4.00
de Candolle, *Origin of Cultivated Plants*, (1906), Appleton	2.00
Chamberlain, C. J., *Methods in Plant Histology*, (2nd ed.), (1905), Chicago University Press	2.25
Conn, H. W., *Agricultural Bacteriology*, (2nd ed.), (1910), (Philadelphia) Blakiston	2.50
Darwin, C., *Insectivorous Plants*, (1892), Appleton	2.00
Darwin, C., *Power of Movement in Plants*, (1892), Appleton	2.00
Darwin, C., *Cross and Self Fertilization in the Vegetable Kingdom*, (1895), Appleton	2.00

Detmer, W., *Practical Plant Physiology*, tr. by S. A. Moore, (1898), Macmillan	$ 3.00
Farmers' Bulletins, U. S. Dept. of Agr., Washington, D. C., (free).	
Freeman, E. M., *Minnesota Plant Diseases*, Minnesota Botanical Survey, (1905), (St. Paul).	
Frost, W. D., and M. C., Campbell, E. F., *A Text-book of General Bacteriology*, (1910), Macmillan	1.50
Gifford, J., *Practical Forestry*, (1902), Appleton	1.20
Goebel, K., *Outlines of Classification and Special Morphology*, (Oxford) Clarendon Press	5.25
Hard, M. A., *Mushrooms*, (1908), (Kirkwood, Mo.) Author	4.75
Jordan, E. O., *A Text-book of General Bacteriology*, (1909), Saunders	3.00
Lubbock, J., *Flowers, Fruits and Leaves*, (1886), Macmillan	1.25
Stevens, W. C., *Introduction to Botany*, (1906), Heath	1.50
Stevens, W. C., *Plant Anatomy*, (2nd ed. rev.), (1910), Blakiston	2.00
Stevens, F. L., and Hall, J. G., *Diseases of Economic Plants*, (1910), Macmillan	1.50
Tubeuf and Smith, W. G., *Diseases of Plants Induced by Cryptogamic Parasites*, (1897), Longmans	5.50
Underwood, L. M., *Our Native Ferns and Their Allies*, (1900), Holt	1.00
Underwood, L. M., *Moulds, Mildews and Mushrooms*, (1899), Holt	1.50
Vines, H. S., *Students' Text-book of Botany*, (1895), Macmillan	3.75

Many bulletins of the Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C., are extremely valuable in high school work and should be obtained when possible.

ZOOLOGY.

ELEMENTARY TEXTS AND REFERENCE BOOKS.

Davenport, C. B., and G. C., *Introduction to Zoology*, (1900), Macmillan	$ 1.10
French, N. S., *Animal Activities*, (1902), Longmans	1.20
Holmes, S. J., *The Biology of the Frog*, (1906), Macmillan	1.60
Hunter, G. W., *Elements of Biology*, (1907), American Book Co.	1.25

Jordan, D. S., and Kellogg, V. L., *Animal Life: A First Book of Zoology*, (1900), Appleton	$ 1.20
Jordan, D. S., and Heath, H., *Animal Forms: A Second Book of Zoology*, (1902), Appleton	1.10
Jordan, D. S., Kellogg, V. L., and Heath, H., *Animals* (consisting of *Animal Life* and *Animal Forms* bound in one volume), (1903), Appleton	1.80
Jordan, D. S., Kellogg, V. L., and Heath, H., *Animal Studies: A Text-book of Elementary Zoology*, (1903), Appleton	1.25
Jordan, D. S., and Price, G. C., *Animal Structures: A Laboratory Guide Designed to Accompany Animal Studies*, (1903), Appleton	.50
Linville, H. R., and Kelly, H. A., *A Text-book in General Zoology*, (1906), Ginn	1.50
Parker, T. J., and W. N., *Practical Zoology*, (1908), Macmillan	2.60
Pratt, H. S., *A Course in Invertebrate Zoology*, (1902), Ginn	1.25
Pratt, H. S., *A Course in Vertebrate Zoology*, (1905), Ginn	1.50
Sedgwick, W. T., and Wilson, E. B., *General Biology*, (1895), Macmillan	1.75
Thomson, J. A., *The Story of Animal Life*, Scribner	1.50
Thomson, J. A., *The Science of Life*, (1899), (N. Y.) Stone	1.25

The following books should be added, if possible, to the above list:

ADDITIONAL TEXTS AND REFERENCE BOOKS.

Davison, A., *Mammalian Anatomy, with Special Reference to the Cat*, (1903), (Phila.) Blakiston	1.50
Hertwig, R., ed. by J. S. Kingsley, *A Manual of Zoology*, (1902), Holt	3.00
Hornaday, W. T., *Taxidermy and Zoological Collecting*, (1891), Scribner	2.50
Howes, G. B., *Atlas of Practical Elementary Biology*, (1885), (London) Macmillan	4.00
Jennings, H. S., *Behavior of the Lower Organisms*, (1906), Macmillan	3.00
Kingsley, J. S., *Vertebrate Zoology*, (1899), Holt	3.00
Lubbock, J., *On the Senses, Instinct and Intelligence of Animals, with Special Reference to Insects*, (Internat. Sci. Ser.), (1888), Appleton	1.75
Parker, T. J., and Haswell, W. A., *A Text-book of Zoology*, (2 Vols.), (1910), Macmillan	9.00

Riverside (formerly Standard) Natural History, ed. by J. S. Kingsley, (6 Vols.), Houghton	$ 30.00
Thomson, J. A., *Outlines of Zoology*, (1899), Appleton	3.50

BOOKS ON SPECIAL SUBJECTS.

Insects and Spiders.

Benton, F., *Honey Bee*, U. S. Dep't of Agriculture, Division of Entomology, New Ser., Bulletin No. 1	.15
Emerton, J. H., *Spiders, Their Structure and Habits*, (1890), (Boston) Whidden	1.50
Folsom, J. W., *Entomology, with Special Reference to its Biological and Economic Aspects*, (1906), (Phila.) Blakiston	3.00
Holland, W. J., *The Butterfly Book*, (1899), (N. Y.) Doubleday, Page	3.00
Holland, W. J., *The Moth Book*, (1903), Doubleday	4.00
Howard, L. O., *The Insect Book*, (1902), Doubleday	3.00
Howard, L. O., *Mosquitoes*, (1901), N. Y. McClure	1.50
Kellogg, V. L., *American Insects*, (1905), Holt	5.00
Lubbock, J., *Ants, Bees and Wasps*, (International Science Ser.), (1882), Appleton	2.00
Miall, L. C., *Natural History of Aquatic Insects*, (1895), Macmillan	1.75
Packard, A. S., *Entomology for Beginners*, (1888), Holt	1.40
Peckham, G. W., and E. G., *Wasps, Social and Solitary*, (1905), Houghton	1.50
Riley, C. V., *Directions for Collecting and Preserving Insects*, (1892), (Wash.) Smithsonian Institute	.25
Scudder, S. H., *Butterflies: Their Structure, Changes and Life Histories*, (1889), Holt	1.50

Crustacea, Worms, Mollusks, Echinoderms and Coelentrates.

Brooks, W. K., *The Oyster*, (1905), (Balto.) John Hopkins Press	1.00
Darwin, C., *Formation of Vegetable Mould through the Action of Worms, with Observations on Their Habits*, (1892), Appleton	1.50
Huxley, T. H., *Crayfish: An Introduction to the Study of Zoology*, (International Science Ser.), (1895), Appleton	1.75
Hyatt, A., *Commercial and Other Sponges*, (Guides for Science Teaching), (1893), Heath	.20

Vertebrates.

Bailey, F. M., *Handbook of Birds of the Western United States*, (1902), Houghton	$ 3.50
Blanchan, N., *Birds that Hunt and Are Hunted*, (1898), (N. Y.) Doubleday	2.00
Chapman, F. M., *Color Key to North American Birds*, (1903), Doubleday	2.50
Chapman, F. M., *Bird Life: A Guide to the Study of our Common Birds*, (1897), Appleton. Without colored plates	1.75
With colored plates	5.00
Dugmore, A. R., *Bird Homes*, (1900), Doubleday	2.00
Jordan, D. S., *A Guide to the Study of Fishes*, (1905), Holt	12.00
Jordan, D. S., *Manual of the Vertebrates of the Northern United States*, (9th ed.), (1900), McClurg	2.50
Jordan, D. S., and Evermann, B. W., *American Food and Game Fishes*, (1902), Doubleday, Page	4.00
Lankester, E. R., *Extinct Animals*, (1905), Holt	1.75
Marshall, A. M., *The Frog*, (1900), Macmillan	1.10
Reed, C. A., *North American Birds' Eggs*, (1904), Doubleday	2.50
Stone, W., and Cram, W. E., *American Animals*, (1902), Doubleday	3.00

PHYSIOLOGY.

ELEMENTARY TEXT AND REFERENCE BOOKS.

Budgett, *Essentials of Physiology*, Saunders	1.00
Colton, *Physiology, Experimental and Descriptive*, Heath	1.15
Eddy, *General Physiology and Anatomy*, Am. Book Co.	1.20
Fitz, *Physiology and Hygiene*, Holt	1.12
Gulick Hygiene Series, Ginn	
I. Gulick, *Good Health*	.40
II. Gulick, *Emergencies*	.40
III. Jewett, *Town and City*	.50
IV. Jewett, *The Body at Work*	.50
V. Jewett, *Control of Body and Mind*	.50
Hewes, *High School Physiology*, Am. Book Co.	1.00
Hough and Sedgwick, *The Human Mechanism*, Ginn	2.00
Huxley, *Lessons in Elementary Physiology*, edited by Lee, Macmillan	1.40

Jones and Stephens, *Outlines of Physiology*, (Phila.) Blakistons	$ 1.50
Krohn, *Graded Lessons in Hygiene*. Appleton	.60
Martin, *The Human Body*, (Advanced course), Holt	2.50
Ritchie, *Human Physiology*, (Yonkers, N. Y.) World Book Co.	.80
Schenk and Güber, *Human Physiology*, tr. by Zoethout, Holt	1.75
Walters, *Physiology and Hygiene*, *Heath*	1.20

LABORATORY GUIDES.

Beddard, Edkins, Flack, Hill, MacLeod, and Pembrey, *Practical Physiology*. Longmans, Green	4.00
Busch, *Laboratory Physiology*, (N. Y.) Wm. Wood	1.25
Gorham and Tower, *Dissection of the Cat*, Scribner	.90
Hall, *Manual of Experimental Physiology*, (Phila.) Lea & Febigers	2.75
Howell, *Dissection of the Dog*, Holt	1.00
Lombard, *Laboratory Work in Physiology*, (Ann Arbor, Mich.) Geo. Wahr	1.50
Stirling, *Outlines of Practical Physiology*, (Phila.) Blakistons	2.00

ADVANCED TEXTS AND REFERENCE BOOKS.

Gerrish, *Text-book of Anatomy*, (Phila.) Lea Bros.	6.50
Greene, *Kirke's Handbook of Physiology* (With Laboratory Outlines), (N. Y.) Wm. Wood	3.00
Hall, *Text-book of Physiology*, (Phila.) Lee Bros.	4.00
Howell, *American Text-book of Physiology*, (2 Vols.), Saunders	6.00
Howell, *Text-book of Physiology*, Saunders	4.00
Hutchison, *Food and Dietetics*, Wm. Wood	3.00
Schaefer, *Text-book of Physiology*, (2 Vols.), Macmillan	15.00
Simon, *Physiological Chemistry*, Lee Bros.	3.25
Sollman, *Text-book of Pharmacology*, Saunders	4.00
Stewart, *Manual of Physiology* (With Laboratory Outlines), Wm. Woods	4.00

PHYSICAL GEOGRAPHY.

TEXT BOOKS.

Davis, *Physical Geography*, Ginn	$ 1.40
Dryer, *Physical Geography*, American Book Co.	1.20
Emerson, *Manual of Physical Geography*, Macmillan	1.40
Fairbanks, *Practical Physiography*, Allyn	1.60
Gilbert and Brigham, *Physical Geography*, Appleton	1.25
Salisbury, *Physiography*, Holt	3.50
Tarr, *Physical Geography*, Macmillan	1.00

GENERAL REFERENCE BOOKS.

Brigham, *Elementary Geology*, Appleton	1.40
Chamberlain and Salisbury, *Geology*, (Vol. I), Holt	4.00
Davis, *Meteorology*, Ginn	2.50
Le Conte, *Geology*, Appleton	4.00
Physiography of the U. S., American Book Co.	1.50
Russell, *Glaciers of N. A.*, Ginn	1.75
Russell, *Lakes of N. A.*, Ginn	1.50
Russell, *Rivers of N. A.*, Putnam	2.00
Shaler, *Aspects of the Earth*, Scribner	2.50
Shaler, *Sea and Land*, Scribner	2.50
Interpretation of Topographic Maps, U. S. Geological Survey, Professional paper No. 60, (free).	
Waldo, *Elementary Meteorology*, American Book Co.	1.50

AGRICULTURE.

Note.—Where no price is given, the book is free.

BOOKS THAT ARE ESSENTIAL.

Bailey, *Nursery Book*, Macmillan	1.50
Brigham, *Progressive Poultry Culture*, (Cedar Rapids, Iowa) Torch Press	1.30
King, *Physics of Agriculture*, (Madison, Wis.) pub. by author	1.75
King, *The Soil*, Macmillan	1.50
Lyon and Fippin, *Soils*, Macmillan	1.75
Osterhaut, *Experiments with Plants*, Macmillan	1.25
Plumb, *Types and Breeds of Farm Animals*, Ginn	2.00

From the Secretary of Agriculture, Washington:

1 complete set Farmers' Bulletins, and extra copies, one for each member of the class, of Nos. 44, 123, 143, 154, 157, 187, 203, 218, 229, 255 and 260.
1 copy of list of bulletins for free distribution.
1 copy of list of publications for sale. (Some of these may be obtained through the congressman of the district.)
Year Books, U. S. Dept. of Agriculture.
1 set Missouri Agricultural College Bulletins.
1 set Missouri Board of Agricultural Annual Reports.
1 set Missouri Board of Agricultural Bulletins.
1 copy *A Unit in Agriculture*, Missouri University Circular of Information.
U. S. Bureau of Entomology, Circular No. 59.
U. S. Office of Experiment Station, Circular No. 34.
U. S. Bureau of Soil Study, Circulars Nos. 13, 195.
U. S. Bureau of Plant Industry, Circular No. 30.
U. S. Bureau of Animal Husbandry, Bulletins Nos. 37, 113.
Bureau of Education Bulletins No. 2 (1907).

BOOKS THAT ARE VERY DESIRABLE, BUT NOT ABSOLUTELY ESSENTIAL.

Bailey, *Cyclopedia of American Agriculture*, (4 Vols.), Macmillan	$ 20.00

(This is the very best work of the kind, and will be of much value to patrons as well as to students.)

Bailey, *Plant Breeding*, Macmillan	1.25
Bailey, *Principles of Fruit Growing*, Macmillan	1.50
Bailey, *Vegetable Gardening*, Macmillan	1.50
Bowman & Crossley, *Corn*, (Ames, Iowa) pub. by the authors	2.50
Burkett, *Soils*, Orange Judd	1.00
Farm Buildings, (Chicago) Sanders	2.00
Farm Science, International Harvester Co. (free).	
Roberts, *The Horse*, Macmillan	1.25
Vivian, *First Principles of Soil Fertility*, Orange Judd	1.00
Voorhees, *Fertilizers*, Macmillan	1.25

DRAWING.

Batchelder, E. A., *Principles of Design*, (1904), (Chicago) Inland Printer	$ 3.00
Batchelder, E. A., *Design in Theory and Practice*, Macmillan	1.75
Brown, G. Baldwin, *The Fine Arts*, Scribner	1.25
De Garmo, *Art Appreciation*, (Syracuse, N. Y.) C. W. Bardeen	.40
Dow, A. W., *Composition*, (N. Y.) Baker and Taylor	1.50
Duval, M., *Artistic Anatomy*, (N. Y.) Cassell	2.50
Edminster, C. F., *Architectural Drawing*, (N. Y.) Williams	2.00
Froehlich, H. B., and Snow, B. E., *Art Education for High Schools*, (1908), (N. Y.) Prang	1.25
Holme, C., ed., *Modern Pen Drawing*, (N. Y.) Lane	4.00
Jackson, T. G., *Lessons in Decorative Design*, (Lond.) Chapman	2.00
La Farge, John, *Great Masters*, McClure, Phillips	2.50
Lilley, A. E. V., and Midgley, W., *Book of Studies in Plant Form*, Scribner	2.00
Longfellow, W. P. P., *Applied Perspective*, Houghton	3.00
Maginnis, C. D., *Pen Drawing*, (Bost.) Bates and Guild	1.00
Miller, L. W., *Essentials of Perspective*, Scribner	1.50
Morris, I. H., *Geometrical Drawing for Art Students*, (Lond.) Longmans	.60
Mumford, J. K., *Oriental Rugs*, Scribner	7.50
Patridge, W. O., *Technique of Sculpture*, Ginn	1.00
Poore, Henry, *Pictorial Composition*, Baker, Taylor	1.50
Reinhardt, C. W., *Lettering for Draftsmen*, (N Y.) Van Nostrand	1.00
Reinach, Solomon, *Apollo or the Story of Art Throughout the Ages*, Scribner	1.50
Rimmer, C. H., *Animal Drawing*, Houghton	5.00
Robinson, *Principles of Architectural Composition*, Arch. Record Co.	2.50
Ross, D. W., *Theory of Pure Design*, Houghtou	2.50
Ross, D. W., and others, *Illustrations of Balance and Rhythm*, (Bost.) Clarke	3.00
School Art Book, (Bound volumes), (Worcester, Mass.) Davis press	1.00
Spanton, J. H., *Complete Geometrical Course*, Macmillan	1.25
Spanton, J. H., *Complete Perspective Course*, Macmillan	1.25

Townsend, W. G. P., *Plant and Floral Studies for Designers*, (N. Y.) Lane	$ 2.00
Tracy, J. C., *Introductory Course in Mechanical Drawing*, American Book Co.	1.80
Western Drawing Teachers' Association, *Annual Reports*, (624 So. Grove Ave., Oak Park, Ill.) Ira Griffith	1.00
Woodbury, C. H., *Pencil Studies*, (Boston) Prang	1.50
Year Book of the Council of Supervisors, (Park Ave. and 59th Street, Brooklyn, N. Y.) Dr. J. P. Henry	3.00

The following periodicals are also recommended:

School Arts Book (monthly), (Boston) National Art Pub. Co., per year	1.00
Art and Progress, (Washington, D. C.) American Federation of Arts	1.50
The International Studio (monthly), (N. Y.) John Lane, Per year	3.50

MANUAL TRAINING.

WOODWORKING.

Crawshaw, F. D., *Problems in Furniture Making*, (Peoria, Ill.) Manual Arts Press	1.00
Goss, W. F. M., *Bench Work in Wood*, (Chicago) Ginn	.70
Griffith, Ira S., *Essentials of Woodworking*, (Peoria, Ill.) Manual Arts Press	1.00
Murray, M. W., *Problems in Woodworking*, (Peoria, Ill.) Manual Arts Press	.75
Noyes, William, *Handwork in Wood*, (Peoria, Ill.) Manual Arts Press	2.00
Park, J. C., *Educational Woodworking*, Macmillan	1.00
Ritchey, S. E., *Woodwork*, American Book Co.	1.00

MECHANICAL DRAWING.

Bennett, Charles A., *Problems in Mechanical Drawing*, (Peoria, Ill.) Manual Arts Press	1.00
Mathewson, Frank E., *Notes for Mechanical Drawing*, (Springfield, Mass.) Taylor-Holden Co.	1.25

PERIODICALS.

Manual Training Magazine, Peoria, Ill.	$ 1.50
School Arts Book, Worcester, Mass.	1.50
Craftsman, New York City	3.00
Wood Craft, Cleveland, Ohio	.50
American Blacksmith, Buffalo, N. Y.	1.00

DOMESTIC SCIENCE AND ART.

HYGIENE, SANITATION, ETC.

Chittenden, R. H., *Nutrition of Man*, Stokes	3.00
Conn, H. W., *Bacteria, Yeasts and Molds in the Home*, Ginn	1.00
Fletcher, Horace, *A. B-Z of Our Own Nutrition*, Stokes	1.00
Hutchison, Robt., M. D., *Food and the Principles of Dietetics*, Wm. Wood	3.00
Ravenhill, Alice, *Practical Hygiene*, Whitcomb and Barrows	1.50
Richards and Talbot, *Home Sanitation*, Whitcomb	.25
Snyder, Harry, *Chemistry of Plant and Animal Life*, Macmillan	1.25
Snyder, *Human Foods*, Macmillan	1.25

THE HOUSE AND ITS MANAGEMENT.

Clark, F. M., *Care of a House*, Macmillan	1.50
Daniels, Fred H., *Furnishing a Modest Home*. (Worcester, Mass.) Davis Piers	1.00

SOCIOLOGY AND ECONOMICS.

Mason, O. T., *Woman's Share in Primitive Culture*, Appleton	1.75
Richards, Ellen H., *Cost of Cleanness*, Wiley	1.00
Richards, *Cost of Food*, Wiley	1.00
Richards, *Cost of Living*, Wiley	1.00
Richards, *Cost of Shelter*, Wiley	1.00
Talbot, Marion, *The Education of Women*, University of Chicago Press	1.25

COOKING AND SEWING.

Barrows, Anna, and Lincoln, Mary J., *Home Science Cook Book*, Whitcomb & Barrows ....$	1.00
Farmer, Fannie Merritt, *Boston Cooking School Cook Book*, Whitcomb	2.00
Hill, Janet M., *Up to Date Waitress*, Whitcomb..........	1.50
Williams and Fisher, *Elements of the Theory and Practice of Cookery*, Macmillan	1.00
Encyclopaedia of Textile Work, (7 Vols.), (Chicago) American School of Correspondence.	

GENERAL.

The following collection of books, issued by the American School of Home Economis, Chicago, is valuable:

The House.
Household Bacteriology.
Household Hygiene.
Chemistry of the Household.
Principles of Cookery.
Food and Dietetics.
Household Management.
Personal Hygiene.
Home Care of the Sick.
Textiles and Clothing.
Study of Child Life.
Care of Children.

ECONOMICS.

For references in General Economics, see page 44. To that might be added:

Bullock, *Select Readings in Economics*, Ginn............$	2.25
Fetters, *Principles of Economics*, Century Co.	2.00
Seligman, *Principles of Economics*, Longmans..........	2.50

COMMERCIAL GEOGRAPHY.

Adams, *Commercial Geography*, Appleton	1.10
Davis, *Physical Geography*, Ginn	1.25
Gregory, Kellar & Bishop, *Physical and Commercial Geography*, Ginn	3.00
Trotter, *Geography of Commerce*, Macmillan	1.10

THE
UNIVERSITY OF MISSOURI
BULLETIN

A

EDUCATION SERIES
VOLUME 1 NUMBER 2

RURAL SCHOOL CONSOLIDATION IN MISSOURI

BY

O. L. KUNKEL
Graduate Student, University of Missouri
AND
W. W. CHARTERS
Dean, School of Education, University of Missouri

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INTRODUCTION.

By consolidation is meant the combining of two or more school districts into one large district. The plan of consolidation best suited for most localities is to consolidate two or more districts, into one consolidated district, to maintain a central school, and to carry the children to school in hacks, as provided by law.

This bulletin is intended to be a practical working manual for the friends of consolidation. All the literature on the subject has been read and that which is applicable to Missouri has been selected. Much material not found in consolidation literature has been collected by correspondence from experts upon consolidation in thirty-five states.

The University of Missouri has established a Bureau of Consolidation to which letters upon any of the questions involved in consolidation may be addressed. Plats and information about proposed plans may be sent to the University if an opinion as to methods and procedure is desired. As far as possible, capable lecturers will be sent out where needed.

The State Department and the State Normal Schools are as deeply interested in consolidation as is the University, and will give assistance upon application.

Address all communications with the University to the Bureau of Consolidation, University of Missouri, Columbia, Missouri.

WORK FOR SCHOOLS OF QUALITY.

There is only one principle upon which to work for consolidation—the principle of improved service. Cheapness is no argument. The school which gives the best service for the money spent is the best school. Country schools are maintained on notoriously low taxes. Yet country children should have an education as good as that of city children.

The best education in consolidated schools will cost more than poor education in one-room schools—if people will pay the money for the best.

If consolidated schools are conducted as poorly as in the one-room schools, they will cost less; but nobody wants them to be run so poorly. They ought to be immeasurably better, and patrons should see to it that they have the best.

It is a characteristic of Missouri patrons that, when they understand a school proposition, they will vote the necessary money; and this holds for rural as well as for city patrons.

The friends of consolidation should, therefore, spare no pains to make clear their plans. They should be made as simple as a primer, and then the fight should be made for good schools, not for cheap schools.

ADVANTAGES OF CONSOLIDATION.

School patrons who contemplate consolidation and transportation of pupils at public expense often desire a statement of the advantages to be gained by the plan. In this bulletin an attempt has been made to bring together results that have followed from actual cases of consolidation and thus to give practical suggestions to those interested in the proposition.

In this section on the advantages of consolidation many different statements of the same idea are given, so that friends of consolidation may select those statements which appeal most forcibly.

I. **It Educates the Children at Home.** Through consolidation country boys and girls are furnished a good education from the kindergarten through the high school without disturbing the home either by separation of members of the family, or by moving to town to educate the children.

It encourages the foundation of good central high schools and gives to the boys and girls in the rural districts equal advantages with the children in the city districts.

Instead of the high school boy going to town to school where he may waste his time at the "nickels", he is kept at home where he helps with the chores and studies under the eyes of his parents.

The course of study may be so arranged as to accommodate the older pupils at such a time as they can be spared to attend school. This would tend to keep the boys and girls on the farm instead of encouraging them to leave it and go to town. This is one of the main purposes of this system.

By centralization all the children of the district have the same chance for higher education, which under the present plan only five or ten per cent are able to get by leaving home and going to the city.

It makes possible a country school equal in every sense to the best city schools, yet within the reach of farm houses. All this can be accomplished without even a small village as a center. for some of the best schools have no connection with any village, but, like country homes, stand in the groves as a part of nature. Without consolidation a high school course cannot be maintained. It is the only means of realizing free high schools for all and accessible to all.

II. **Fewer Colds and Less Sickness.** The health of the children is better guarded when they are conveyed from their homes to the school in comfortable vehicles than when they have to travel through mud or snow for a mile or more to the school, as they often do under the present system.

The health of the children is better when conveyed in wagons and landed warm and dry than when sitting all day with wet feet and soggy clothing after tramping through all kinds of roads in all kinds of weather.

III. **Decreases Cost or Improves Service.** It will reduce the per capita cost of education in the districts affected in nearly every case, and in every case where the first cost of buildings, where buildings are required, has been paid.

It is more economical. Parents who are observant say that the cost of shoes worn out in walking to the separate schools and the cost of medicine and doctor's bills more than pay for the transportation. Cost and maintenance of school buildings, apparatus, furniture, tuition and coal are reduced. It equalizes the cost of schooling, making it no more per capita for an outlying, thinly populated district than for any other.

Hillsboro Consolidated School, Prince Edward Island, Canada.

It increases property values as a whole for those who care to sell, and it broadens life for those who stay.

It makes unnecessary the present costly system of sending the young men and women at private expense to village high schools, thus supporting a double system of education for country children.

The rich and the poor will have more nearly equal advantages in securing a high school education. What is now the privilege of a few will become equally the opportunity of all. It gives an opportunity to the promising, ambitious boy or girl, regardless of wealth, and in return the state is endowed richly with a citizenship of superior quality and efficiency.

At the same expense much better schools can be provided, because, fewer teachers being needed, a better grade can be secured, a division of labor established, and at least some sort of supervision inaugurated.

However, the argument to lay stress upon is—not decreased expense but improved service.

IV. **It Makes the Children Like School Better.** A school spirit, which can only come from several people doing the same work in the class, is gained. Consolidation engenders that healthy educational spirit which can only come with the association of numbers. It provides for larger classes from which teachers are able to secure that interest and healthy rivalry not found in the small district school.

Consolidation tends toward a more healthy social spirit in the school and in the community; rural and village children mingle together upon a common plane, the one securing much from the other. Parents and teachers become better acquainted with each other through frequent social gatherings at the common meeting place—the school house. Home and school are brought into close relation to each other.

It militates against the self-consciousness due to lack of association, so often noticeable in country children, as it goes against the domineering influence of one or two "big scholars" in a small school.

The social life of the pupil is widened and the circle of acquaintance extended. The larger association improves the manners of the pupils, strengthens their individuality, broadens their experience with others and makes them better and more intelligent citizens.

It quickens public interest in the schools; and pride in the kind and quality of work done is manifest. Pupils have the advantage of that interest, enthusiasm and confidence which large classes always bring.

Consolidation is one of the means of solving the problem of compulsory education, and under it there is practically no need of a truant officer. School attendance, when children are conveyed, increases from fifty to one hundred and fifty per cent in numbers, regularity and number of days; and *there is neither tardiness nor truancy.*

It keeps the boys and girls in school a longer time, and especially those advancing beyond the discipline and instruction of the small school.

V. **Better Teachers.** Because of the improved conditions, teachers show greater enthusiasm for and interest in their work. Teachers, thus working together, feel and exhibit the effect of contact, a condition in marked contrast with that of one working alone month after month with no companionship but that of children. The consolidated school is a graded school, thus narrowing the field of instruction for the individual teacher, allowing fewer classes and better preparation for each. Because fewer teachers are needed, better salaries can be paid and only thoroughly qualified teachers will be employed.

It makes possible the employment of at least one well educated, experienced teacher, under whose supervision the other teachers and the children will do more and better work. It makes possible the employment of special teachers who can, if necessary, divide their time among a number of consolidated schools, thus making it possible for the country child to receive first-class instruction in such subjects as music, art, manual training, agriculture and domestic art.

The consolidated school tends to keep teachers for longer terms, thus restricting to a considerable degree the evils which follow from frequent change of teachers. The consolidated school secures a larger share of the experienced teachers and those who have received Normal School training. The best teachers seek positions where systematic and graded work is possible. While teachers will take $40 positions in the grades in towns in preference to $60 in a one-teacher school, the best teachers in small cities will go to two-teacher country schools in preference to city schools.

VI. **Better Taught School.** It will secure better classification of pupils so that both teachers and pupils may spend their time to better advantage. The teacher's work is so organized that the average recitation period is trebled.

Consolidation allows pupils to be placed where they can work to the best advantage, allows the various subjects of study to be wisely selected and correlated and provides more time for the recitation.

VII. **Better Equipment for the Same Price.** It leads to the creation of more commodious school houses and larger accommodations and means of instruction. The children have the benefit of modern school buildings and of modern conveniences in the way of ventilation and sanitary arrangements. The buildings are more comfortable and better adapted to school purposes. The same number of rooms can be constructed more cheaply when combined in one building than when constructed separately.

Better equipment for primary work can be secured. Instead of having to duplicate the charts, globes and other apparatus in separate schools, a much larger variety can be secured for the same outlay.

The larger school means better libraries and hence good literature.

VIII. **Miscellaneous Advantages.** The consolidated school always becomes the trading point, and the parents, through pupils, have daily access to this trading center, and can attend to matters which otherwise would require time and attention.

Ethical culture is afforded free from dissipations of social life as manifested in cities.

It makes possible the conduct of a school with the proper regard to the industries and professions of life, and it is the best way in which agriculture, nature study and household science can be generally introduced into the country schools. It is the only complete solution offered for agricultural education.

It eliminates illiteracy on the one hand and on the other the false views of city life so commonly imbibed by school children, thus rationalizing the emigration from country to city.

By this plan the farm again, as of old, becomes the ideal place in which to bring up children, to give them the advantages of centers of population and have them spend their evenings in the home.

It brightens and broadens country life.

With consolidation come better roads, giving the farmer the best facilities for transportation and thereby increasing the value of the farm.

One or two families cannot "freeze out the teacher."

Consolidation provides for a paid janitor, who is able to keep the school building and grounds in a neat, attractive and sanitary condition.

Athletics is one of the factors in the solution of the problem of "how to keep boys in school," and consolidation furnishes even better advantages for athletics than the city school.

Pupils are under the care of responsible persons from the time they leave home in the morning until they return at night.

It tends to prevent difficulties that often arise on the way to and from school, such as loitering by the wayside or fighting.

Children are protected from the danger of those offenses to decency and good morals so common on the road going to and from school—conditions so well understood by everybody who has ever taught a country school.

The school wagons can be used for the transportation of patrons to entertainments, lectures and concerts.

School Building at Kingsville, O., where Centralization of Schools Began in 1892.

Transportation makes it possible where there is no mail delivery to distribute mail throughout the whole district daily.

Transportation makes it easier to maintain a quarantine in case of disease.

OBJECTIONS TO CONSOLIDATION.

A large number of objections to consolidation are made, especially by those who have never tried the plan. Most of these objections are trivial, but all of them deserve careful consideration.

I. **Abandonment of Old Building and Initial Cost of New.** One of the most frequently mentioned objections, and one that often causes districts to hesitate over making a trial of consolidation is the necessity of abandoning the old district schools and erecting a new central building. The patrons urge that the buildings which they have in the district are too good to be abandoned. They say, also, that the consolidated district might build a new large central school building and then later the patrons might wish to return to the old regime.

One way of overcoming such possibilities is to do as did the districts at Milton, Sumner County, Kansas. The Sumner consolidated district was formed by the consolidation of five separate school districts in 1904, the central school being located in a small village, which, at the time of consolidation, contained probably fifty inhabitants. Here consolidation began by moving two school houses to the site of the central school house at Milton, with a view to moving them back if consolidation should not prove satisfactory. The remaining old houses and school sites were sold for something between $600 and $800. The plan proved satisfactory and in 1905 or 1906, after conducting the work in the three small school houses, a fine gray brick four-room school house was erected at a cost of something over $6,000.

By this means the small school buildings may be used for a number of years and if at any time the people of the district wish to go back to the old plan of single districts it is an easy matter for them to move the small school buildings back to the several small districts. This seems to be an excellent plan, for it gives the districts a chance to try consolidation before committing themselves to the plan. If, after a fair trial, consolidation in the particular district in question is found to be satisfactory, then the people will feel more like putting their money into a good central school. Such a plan certainly meets the objections above stated.

II. **Fear of Increased Expense.** People often fear that consolidation will be more expensive than the present small schools. A thorough study of the matter of cost shows that consolidation, while furnishing better schools, costs the same or even less than the small schools.

According to the report of the Committee of Twelve in 1897, consolidation is never more expensive than the small school for the same quality of service. The same committee also states that it is doubtful whether any money expended in the people's interest is expended more wastefully than that which goes to the present country school.

Of the townships in Massachusetts that had tried the plan of consolidation up to 1900, 68 per cent report the cost as less, while only eight per cent, report the cost as greater. Of 124 New Hampshire townships that reported concerning the cost of transportation, 95.1 per cent gave the cost as less, 4 per cent gave the cost as the same, and .9 per cent gave the cost as more. Twenty-six of these townships gave the cost with conveyance as one-half that of local schools, eight gave it as one third, seven as one-fourth, three as one-fifth, and one each as one-sixth, three-eighths, two-fifths, and three-fifths.

In subdistricts numbers 10 and 13, Lake County, Ohio, it has been found that consolidation has reduced the cost per pupil on the basis of the total enrollment from $16.00 to $10.48, and on the basis of the average daily attendance from $26.66 to $16.07.

According to the statement made in 1908 by E. A. Jones of Ohio, the average cost of transportation per wagon per day in that state is $1.50, the average distance traveled is four and one-half miles and the average number of pupils conveyed by each wagon is twenty.

At Terrill, Iowa, the enrollment in the consolidated school was, in 1902, 165, and almost all the pupils were transported. Seven drivers were required and the average cost per pupil per month was $1.53. Vermont transports 7,651 children for $36,000 per term or a little less than $4.71 each. On the average it costs about $1.50 per month to convey a pupil to a central high school. This is much less than it costs to provide a school within walking distance of the pupil's home. Transportation is the only added expense incurred by consolidation of schools. This expense is more than met by the saving which is made in other lines because the consolidated school requires fewer teachers and the central building costs less than was expended on all the small buildings. There is thus, a saving of apparatus, fuel, incidental expenses, etc. By consolidation the same school can be had for less money, a better school for the same money, or a much better school for more money. This is the verdict of those who have tried the plan.

Money Saved by Consolidation. The following financial statement gives the gain due to consolidation in La Grange County, Indiana:

Number of central schools receiving conveyed pupils....	14
Number of central schools abandoned..................	38
Additional teachers required in central schools.........	7
Saving in number of teachers..........................	31
Saving in salaries of teachers..........................	$10,651.60
Saving in fuel and repairs.............................	2,260.00
Total saving..	$12,911.60
Number of pupils conveyed............................	428
Number of hacks required.............................	29
Total cost for transportation for the year...............	6,176.86
Net saving not counting additional cost of fuel and janitor service in consolidated schools.....................	6,734.74

In Duval County, Florida, the transportation system now in operation produces a current saving of $462.00 per month over the old system. Taking from this the increase of salaries for eight assistants at the centralized schools, $225.00, and there is still left a net saving of $237.00 per month.

However, cheapness is not the consideration. The best possible school is the important thing. The average town in Missouri taxes itself 100 cents on the one hundred dollars, and a consolidated district, as a rule, cannot levy a tax so high as the average town. Cheapness is worse in education than it is in clothes. Quality pays; and school patrons should not be concerned with how cheap consolidation is but with the amount of value they get for their money. A country child deserves as much as his city cousin.

III. **Missouri Dirt Roads.** Another objection to consolidation in Missouri is the condition of roads in certain parts of the state during certain parts of each year. Transportation is difficult where there are dirt roads.

This objection is, however, not serious; for there are very few places in the state where the roads are impassable during any considerable period of time.

In some of the states where consolidation has been most successful, the roads are very bad. In Astabula County, Ohio, the county in which consolidation first began in that state twenty years ago, and one in which there were in 1908, as has already been stated, 21 consolidated schools, "the land is", according to the report of Hon. A. E. Palmer, delegate from the Michigan State Grange to investigate the system of consolidation in actual practice, "heavy clay" and "the roads are very poor a portion of the year." The number of consolidated schools in Ohio increased from 92 in 1906 to 157 in 1907, and yet according to the same authority as above quoted "the roads are mainly clay and of that kind that refuses to let go. With the apparent depth as indicated by the ruts and general roughness even as late as the first of May, it seemed plausible to assume that it was an ideal section to test the desirability and efficiency of the transportation, a problem which all authorities upon the subject seem to be agreed is an absolute essential to the plan of centralization. During some seasons of the year the roads, it is claimed, are in excellent condition, but mainly during the months when schools are not in operation. In a few localities, especially near the shores of Lake Erie, more or less sand prevails, but on the whole any one who travels a few hundred miles over the average Ohio road will quickly conclude that the good roads problem is in that state just as far from solution as it is with us; so if the decision of the question of centralized schools depends upon the question of roads, Ohio has no advantage. Ohio is solving her rural schools problem, in spite of bad roads. It is reported that the transportation wagons, serving the consolidated schools of Ohio, seldom fail to get the children to the school on time, although an extra team is sometimes necessary in order to do this." There are bad roads in Iowa, and yet transportation is successful in that state, 859 children being transported in 1904. Bad roads hinder, but they do not prohibit the consolidation of schools.

IV. **Do Drivers Charge Exorbitant Prices?** It is sometimes claimed that it is difficult to procure proper conveyance on reasonable terms, but the experience of consolidated schools everywhere tends to discredit this objection.

In Vermont the average annual cost per pupil for transportation for the eight years from 1894 to 1902 was $13.27 a year, which with a school term of 155 days makes the expense of transportation about 8½ cents a day for each pupil. In Connecticut with a school term of 189 days the average daily cost per pupil during the four years from 1897 to 1901 was 7 5-6 cents, $1.56 per month per pupil, or $14.48 per pupil for a school term of eight months. At this rate it will cost $249.60 to transport 20 pupils to a central school. In Winnebaga County, Iowa, the compensation paid drivers is from $25 to $40 per month and the driver furnishes the wagon and meets all expenses incurred in transporting the pupils on his route.

In Kalamazoo County, Michigan, in the Kalamazoo and Comstock consolidated district the cost of transportation per pupil per month is $1.40; in Barnes County, North Dakota, in consolidated district numbers 41 and 19, it is $1.00; in Richland County, North Dakota, in consolidated district No. 135 it is $1.80; in Salt Lake County, Utah, in Jordan consolidated school it is $1.20; in Trumble County, Idaho, it is 80 cents; in Pueblo County, Colorado, in consolidated district No. 18 it is $2.00; in Augusta County, Virginia, it is $2.00; in Ellsworth County, Kansas, in consolidated district No. 26 it is $3.00; and in Woodford County, Illinois, it is $3.00 or less. Even at 15 cents a day the cost, per pupil, per school year of eight months, is only $24.00; at 4 cents per day it is only $6.40 per year. These figures do not indicate unreasonable charges for transportation. Reports from consolidated schools in many different states show that there is no difficulty in obtaining proper conveyance on reasonable terms. If a driver on this basis carried 20 children his charge per month would run from $16.00 to $60.00, with the average running under $30.00.

Often an older boy attending school and living near the end of the route will "take the job" of driving and at very little expense, because he drives in in the morning with the load of children, attends school and drives back in the evening after school.

V. **Contagious Diseases in the Wagons.** The fear has sometimes been expressed that where the different schools are brought together and pupils from different homes are conveyed in the same wagon, there will be great danger of spreading contagious diseases. In actual practice it is found that this difficulty is not very great. Mr. E. A. Jones, formerly State Commissioner of Common Schools, Columbus, Ohio, says, in referring to this objection: "I am sure I can truthfully say that the experience of Ohio for the past twelve or fifteen years has shown that there is no valid ground for this objection." And certainly there is no more danger in a wagon than in a poorly ventilated and overheated school room.

VI. **Careless Drivers.** Parents sometimes fear that careless drivers may be employed who will not attend to the comforts of the children and whose influence upon the children may not be good. Experience shows that there are no difficulties in this regard when school boards use the proper care in the selection of drivers. Reports from a large number of consolidated schools show that all that is necessary is to have the drivers sign the proper contracts and to include bond to perform the duties specified in the contract.

VII. **Away from Home Longer.** The objection is sometimes raised that in the consolidated district the children would have to get ready for school earlier and would return from school later than when they walked to the nearby school. It may well be questioned whether even the pupils who are farthest from the central school are on the road longer when conveyed than when they formerly walked a shorter distance to the district school.

VIII. **Other Objections.** It is sometimes held that the larger school will require better clothing and increased expense to the parents; that consolidation will throw many teachers out of employment, and that the children will all have to eat cold dinners, etc. These objections can hardly be called objections; they are excuses and are put forward only by those who for other reasons oppose consolidation.

KINDS OF CONSOLIDATED SCHOOLS.

There are several kinds of consolidated schools. These differences result from the different ways in which the schools accomplish certain desired ends. But there is only one thing essential in order that a school may be termed consolidated,—it must be made up of two or more smaller schools. Such a combination necessitates a number of changes in the organization of the school, such as more pupils, better equipment and usually more than one teacher.

In certain cases schools are consolidated for high school purposes only. Such schools are usually formed by the combination of four or more small districts. They maintain a central high school which all the children of the consolidated district may attend free of charge. But in addition to this school the consolidated district maintains a grade school in each of the original small districts. In such cases of consolidation, since the district maintains grade schools in the buildings of the local districts, and since the patrons are by such consolidation deprived of none of the advantages of a nearby grade school, but receive in addition the advantages of a central high school, transportation is not provided at public expense. In such consolidated districts both grade and high school work may be done in the central school and all the children living in the small district in which the central school building is located may attend this school. This kind of consolidation, slightly modified, is in operation in Illinois. In that state not more than four separate small grade schools are supported in any one township and the consolidated district usually consists of one entire township. It has proved very satisfactory to the people of Illinois. (For rules for forming a joint high school district in Missouri see sec. 10852 R. S. Mo. 1911).

Consolidation for high school purposes costs more than consolidation for the purpose of doing grade work or for the purpose of doing both grade and high school work in the central school. But it is free from all those objections that are raised against closing the small grade school. It is also free from most of the alleged difficulties connected with transportation, because pupils of high school age are better able to go long distances to school than are younger children, whether they walk or are transported at public or private expense.

Consolidation for high school purposes is not very satisfactory in Missouri because under the law not enough money can be set aside to maintain a good high school.

A second sort of consolidation is found by which the small district schools have been discontinued and all the pupils in the consolidated district attend the central school which usually offers a high school course. This is the sort of consolidation that we advise.

CONSOLIDATED SCHOOLS IN MISSOURI.

A number of attempts at consolidation have been made in this state. According to the 1910 report of the State Superintendent of Public Schools, there are eighteen consolidated districts. These districts are located in ten different counties of the state. Some have consolidated for high school purposes only, while others have consolidated their grade schools.

Reports from all the districts could not be secured, but the following is a summary of typical cases:

Consolidation in Jackson County. Consolidation first began in Jackson County in 1902 when district No. 1 was organized. In this county in 1904 consolidated district No. 2 and in 1907 consolidated district No. 3 was organized. These districts embrace from twenty-five to thirty square miles each and maintain central high schools. They were organized for high school purposes only and do not furnish transportation to the students that attend the central school. All the students above the seventh grade attend the central schools, the eighth grade being included in the high school course. In 1907 district No. 1 made a levy of 75 cents on the one hundred dollars assessed valuation of its property, district No. 2 forty cents and district No. 3 fifty cents on the assessed valuation of its property taxable for school purposes.

Successful in Dade County. In Dade County there are three consolidated districts. Each of these districts has been formed from the union of two small districts, for the purpose of maintaining a two-room grade school. The County Superintendent reports that these schools are doing better work than was done before consolidation. The chilrden are not transported.

Two Districts in Randolph. In Randolph County two districts have been consolidated. The central school building is located at Clifton Hill. This school does both grade and high school work, contains ninety children and makes a tax levy of one hundred cents on the one hundred dollars. No transportation is provided the children in this district.

Thus we see that Missouri has both kinds of consolidated schools, i. e., consolidated schools for high school purposes only, as in Jackson County, consolidated schools for grade school purposes, as in Dade County, or for doing both grade and high school work, as at Clifton Hill in Randolph County.

HOW TO CONSOLIDATE.

In the pages that follow an attempt has been made to outline a plan which may be of use to school patrons and superintendents who desire to promote consolidation of schools in their communities.

I. **Know County Conditions.** The patrons of the schools, after having decided to begin the agitation for consolidating a group of schools should acquaint themselves with the conditions existing in the several districts thereof. They should consider the size of each district, its location with reference to other districts, the amount of money being spent, the number of pupils, the condition of the roads and the sentiment of the people. They should also take into consideration the condition of the small school buildings. If the districts which they propose to consolidate have two or more good buildings they should consider the advisability of moving them to some central location. If all the buildings in the district to be consolidated are old and worth but little, then it will be cheaper to build one central building than to move several small buildings.

The Bono Consolidated School, Johnson County, Texas.

The size of the consolidated district will depend largely upon these local conditions. The proposed district should be small enough to keep the farthest children within a reasonable driving distance from the central school.

Valuation of District. If a group of districts do not expect to run a four-year high school, there is no minimum to the valuation of the proposed district. But if it is expected to run a four-year high school the minimum assessed valuation of the proposed district should be more than $350,000. There were seven high schools accredited to the University which in 1910 had a valuation of less than $250,000 each, but they had to depend on outside tuition and could make a levy of 100 cents for maintenance.

However, if a consolidated district does not have money enough to run a four-year high school, they can run a one, two or three-year one.

Size of District. According to John F. Riggs, State Superintendent of Public Instruction in Iowa in 1905, children should seldom, if ever, be required to ride a greater distance than five miles. On the other hand, the Burns Consolidated School in Marion County, Kansas, has an area of forty-three square miles, and one of the wagons has to go ten and one-half miles. It is reported that wagons make the trip to the school in about one and one-half hours and that the transportation thus provided is

Old School Building Abandoned when these Districts Consolidated with the Bono District.

satisfactory to the people along the route. Mr. E. A. Jones, State Commissioner of Common Schools in Ohio, said in 1908 that in his state every effort is made to get the children to school in an hour and fifteen minutes from the time they leave their homes. The country roads of Missouri can be favorably compared with the country roads of Ohio and in that state the average distance which a conveyance transporting children has to go is about four and one-half miles.

II. **Know Consolidation Laws.** The leaders should make themselves familiar with all consolidation laws. For this purpose reference should be made to sections 10776, 10837, 10852 and 10883 of the Revised School Laws of the State of Missouri, Revised Statutes, 1911.

Old School Building Abandoned when these Districts Consolidated with the Bono District.

III. **Let the People Know.** A printed statement of the facts which have been obtained concerning these districts and an estimate of the cost of carrying on the proposed consolidated school, should be distributed among those living in the districts concerned.

These facts should be placed in the hands of all those who show an interest in consolidation. Newspapers should be used freely and every possible means adopted to acquaint the people with the facts. For without question, if the people of Missouri understand a proposition for education they will provide means for securing it.

IV. **Public Meetings Before Election.** Public meetings should be held in the different districts for the purpose of discussing consolidation. At these meetings addresses should be made by those best informed regarding consolidated schools. The State Department, the Normal Schools and the State University have men well-versed in the subject. The friends of the proposition should at this time be prepared to outline in a very definite way what they propose to do. They should point out the advantages of the consolidated school over the small district school. This agitation should precede the annual school meeting of each school district held on the first Tuesday in April of each year by a period of several months and many meetings should be held to arouse interest for the proposition.

V. **Form of Petition.** If the proposed plan to consolidate meets with favor, then petitions, having the form given below, should be signed by ten qualified voters residing in the territory affected by the change. As many copies of the petitions should be signed as there are districts to be consolidated, and a copy should be sent to the clerk of each district concerned.

FORM OF PETITION FOR CHANGE OF BOUNDARY.

(See Mo. School Law, 1911, page 50.)

To the District Clerk:—

We, the undersigned qualified voters (ten or more) of District No. ...., County of ...., State of Missouri, desire the following changes in district boundary lines:

....

....

and hereby petition you "to post a notice of such desired change in at least five public places in each district interested, fifteen days prior to the time of the annual meeting."

(Signed by ten or more qualified voters residing in any part of the territory affected by the proposed change.)

VI. **Method of Forming District.** On receipt of a petition having the form shown above and properly signed, it becomes the duty of each district clerk, fifteen days prior to the annual election, to give notice of the proposed change in five public places in the district, or in all the newspapers of the district. (Sec. 10837 R. S. Mo. 1911). Such notice having been given, the change described in the notice becomes a matter to be voted on at the annual meeting. A majority vote in all the districts forms the new district.

If only one, or, more than one, but not all of the districts concerned, has a majority vote asking for the change, the case is not settled, for an appeal may be made to the County Superintendent for arbitration, who upon receipt of an appeal filed with him in writing not more than five days after the annual meeting, shall appoint four disinterested men, having certain qualifications specified by law, who, together with the Superintendent, shall constitute a board of arbitration and shall investigate the claims made by those on both sides of the question, and decide the matter.

When the decision by vote or by arbitration favors consolidation the consolidated district shall be organized according to provisions of Sec. 10843 R. S. Mo. 1911.

VII. **The New School District.** The consolidated district, when formed, may or may not continue its several small schools. This may be decided at the first meeting as provided by Secs. 10843 and 10845, R. S. Mo. 1911. The small schools may be continued and a central high school established, or the small schools may be discontinued and a central school established for the accommodation of all the children of the district. Such a school may do only grade work, or it may do both grade and high school work, according to the wishes of those concerned and the conditions existing in the district.

In case the small district schools are discontinued, two or more of the small school houses may be moved to the site of the central school. This, as has already been stated, was the plan that was followed by the consolidated district at Milton in Sumner County, Kansas. In the small houses moved to the central point a well graded school may be held. In one building all of the work of the first three grades may be taught by one teacher, in another building all the grades above the third grade and below the high school may be taught by another teacher, and in still another building a teacher, especially fitted to teach high school subjects and to supervise the work of the grades, may take those who have completed the eighth grade work.

If the buildings in the district are old at the time of consolidation, then, it is best for the consolidated district to build a good central building at once.

STUDIES OF PROPOSED CONSOLIDATED DISTRICTS.

CASE I.

The following is a study of a group of districts showing one method of handling the facts. The plat on page 23 contains

(1) Boundaries of school districts
(2) Roads
(3) Number of children in each house on each road
(4) Proposed transportation routes.

These are all drawn to scale. For purposes of explanation before audiences, at least one such map should be made on a large sheet of unbleached white muslin large enough to allow a scale of a foot to a mile. The plat may be made with jap-a-lack or black paint and a small brush.

This will be little trouble and will make the idea clear.

I. **Assessed Valuation.** In this group there are five districts with an assessed valuation as follows:

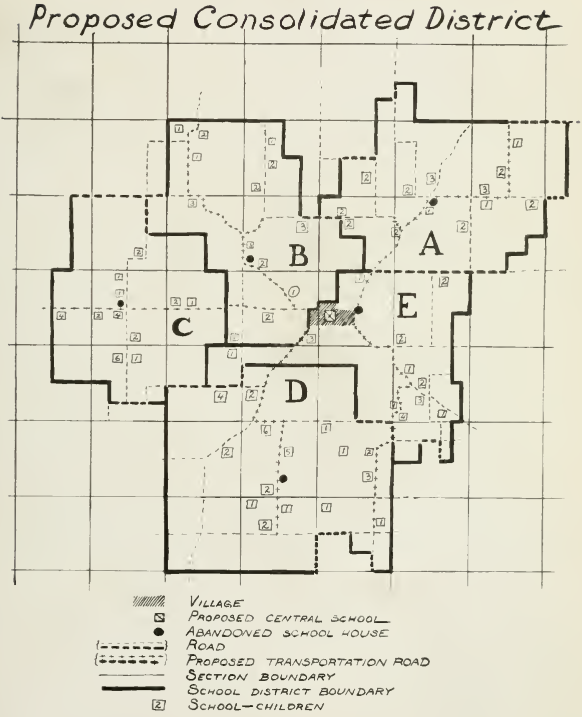
A	$53,030
B	97,850
C	48,190
D	73,010
E	111,755
Total	$383,835

This assessed valuation will be of interest in connection with the following table of high schools accredited to the University of Missouri showing the numbers in relation to assessed valuation.

Number of accredited high schools with an assessed valuation of

Less than $250,000	7
Less than $300,000	17
Less than $350,000	23
Less than $400,000	29
Less than $450,000	40
Less than $500,000	52

These are town schools and do not have to transport children. If we allow for transportation, the $383,835 assessed valuation of this district will be about the equivalent of $290,000 in a town district. And there are of such districts 17 which have accredited high schools (about 12% of the high schools of the state).


Proposed Consolidated District
A
B
C
D
E
Village
Proposed central school
Abandoned school house
Road
Proposed transportation road
Section boundary
School district boundary
School—children

Total Enumeration

A	33
B	39
C	38
D	35
E	68
	213

This means that under the law this district may organize as a town school district, having as it does over 200 children of school age (R. S. Mo. 1911, sec. 10864), and will thereby be entitled to certain privileges, as for instance the privilege of increasing the maximum levy to 100 cents for school purposes (R. S. Mo. 1911, sec. 10825).

II. **Transportation.** Five routes will take care of all the children living more than one-half mile from the school house (children living less than one-half mile distant are not entitled to transportation under the law). The roads are in the main good clay roads.

These routes may be as follows:

A, beginning in District A center of north of 5, south to S. line, southwest to middle of S. line of 6 and direct to village, with one side trip in S. W. quarter of N. W. quarter of T. to E. line of 12, where two children from 1 and four from 12 will be picked up. Two children along N. line of 18 will be picked up where road crosses line of 13.

B, beginning north line of 3 direct to middle of E. line of 10, side trip to center of N. W. quarter of 11 where five children in 2 and three from northeast of 11 will be picked up, then back to middle of E. line of 10 and into town. The wagon carries a total of 20 children, and the farthest child rides 4¾ miles.

C. begins center of 17 due east to school, picking up two in 9 and seven in 21 at the center of 16. The wagon will carry a total of 28 children and the farthest child rides 3½ miles.

D. begins at the center of 35, goes due north to center of S. line of 23 where one child from 25 is picked up, then to main road near W. line of 23 where two children from 27 are picked up; then on into the village. This wagon carries a total of 27 and the farthest child rides 3½ miles.

E. begins near center of 36 north to E. line of 25, north to main road and on into the village. This wagon will carry a total of 22 children and the farthest child will ride 3¾ miles.

Note.—These distances in every route are very reasonable and no child need be on the road more than one hour. The average will be twenty minutes. The wagons will usually carry less than the totals given because of absences from school.

Present Expenses of Five Districts—

	A	B	C	D	E	Totals
Length of Term, months	7	8	8	8	7	
Salary of Teachers..	$350.00	$400.00	$440.00	$400.00	$805.00	$2395.00
Salary of Janitor...	6.30	22.90	16.45	16.00	35.00	96.65
Salary of Clerk.....	5.00	7.00	10.00	10.00	10.00	42.00
Fuel	13.48	22.71	40.40	15.00	35.00	126.59
Total Incidentals....	60.55	74.36	209.38	47.00	153.97	745.26
Total Salary and Inc	410.55	474.36	649.38	447.00	958.97	3140.26
Assessed Valuation...	53,030	97,850	69,635	73,010	111,755	383.835
Levy	65	40	40	40	75	

Total expense for five districts, $3140.26

Average Daily Attendance—

A	19
B	29
C	33
D	27
E, outside village	9
E, in village	45
	162
Total (not in village)	117

Estimated Cost of Running Consolidated School.

Transportation. There are 117 children to be transported daily. Those living in the village would walk. Figuring from cost in other states, we may set the cost at $1.00 per child per month. The total cost will be approximately $1,000.

Teachers. The average daily attendance is 162. Five teachers can take care of these and the principal can teach some high school work in addition. Four of these teachers can be easily secured for $40, because while $50 is paid to get rural school teachers, as good a quality or better can be secured in a graded school for less money. The present principal of the village school can be retained for $65.

4 teachers at $40 for 8 months....	$1280
1 principal at $65 for 8 months....	520
Total for teachers...............	$1800

Fuel. A five room school building can be heated for $65 a year in this locality.

Janitor service can be secured for $75 for the year on the basis that the two-room school in the village pays $35 a year.

Clerk's expenses would amount to about $15 for all purposes.

These total as follows:

Transportation	$1000
Teachers	1800
Fuel	65
Janitor	75
Clerk	15
Other incidentals and repairs..	150
Total	$3105

Comparison.

Separate districts now pay	$3140.00
Consolidated district (estimated)	$3105.00
Saving	35.00

This means practically, however, that three of the districts, B, C, and D, levying 40 cents, would have to raise their assessment while the other two would lower to strike an average.

The best proposition to be made and fought out in these districts is this: Are you willing to raise your levy to 65 cents and have a graded school with three years' work in the high school and six teachers employed?

This can be easily done for 65 cents on $383,835 assessed valuation of the whole district. The whole district would give an increase of $490 which would more than enable the district to hire an additional high school teacher and give three years of high school work.

Natural growth of sentiment with the success of the school would undoubtedly increase the levy because that always happens in towns, and farmers are just as friendly to education as are city patrons if they can see that they are getting the worth of their money in better schools.

Initial Cost of Consolidation. This is difficult to state in terms that would hold for every locality. It so happens that there are three buildings in these districts, none more than 2½ miles from the village, in good condition, that could be moved in and used. This with the two-roomed village school would take care of all the pupils and the initial cost would be largely the cost of moving them in and repairing them. This cost would be largely defrayed by the sale of the sites and the remaining school building. Later the district could build a good modern building, and the sooner the better.

A proposition to build a new building would depend upon what the sentiment of the districts is. The village would very probably be willing as individuals to pay a good part of the initial cost of putting up such a building on ample school grounds.

Five covered wagons to be owned by the district would cost in addition about $150 each.

CASE II.

Another group of districts in which the saving would be much greater is the following. The saving is greater because the number of pupils in each school is smaller.

Present Expenses—

	A	B	C	D	Totals
Enrollment	27	12	21	6	66
Daily attendance	20	7	14	5	46
Term	6	8	6	7	
Total Salary	$240.00	$320.00	$240.00	$280.00	$1080.00
Total Incidental	164.33	75.20	91.59	40.99	372.11
Total Expense	400.33	395.20	331.59	320.99	1452.11
Assessed Valuation	50,770	99,175	68,000	68,530	282,475
Levy	55	40	40	50	

Two teachers could take care of these children easily in a central school. Two buildings are in excellent condition, and could be moved into the center. Three wagons would cost $450. They could pay their teachers $40 a month, as at present. The estimates of expense would be as follows:

2 teachers at $40 a month for 8 months	$ 640
46 pupils to transport at, say, $1.50 a month (Three wagons would be necessary)	552
Incidental expense in total..............	150
Total	$1342

Comparison.	4 districts at present spend	$1452.11
	Consolidated district	1342.00
	Saving	110.11

This means that all the children would have an eight-month school where now only one school has, that they would have two teachers with four grades to a room and only 23 pupils in each room. Also by raising the levy to 60 cents they could put in another teacher, do two years of high school work, and have plenty of money left. Fifty-five cents, the levy now made in one of the districts, would probably do the work.

That is, by all the districts paying what one does and consolidating, they could have a graded school and two years high school. At present individual patrons in these districts pay a total of over $2500 a year sending their children away to high school. Two years of this could be had at home by consolidating.

TRANSPORTATION.

The consolidated district may or may not provide transportation. If the consolidated district is large and all the pupils attend the central school, then transportation either at public or private expense becomes absolutely necessary.

An act passed by the last legislature and signed by the Governor makes provision for transportation of children at public expense (Sec. 10776 R. S. Mo. 1911).

WAGONS.

Transportation Wagons, North Dakota.

In most cases, though not in all, where transportation is provided at public expense, the district owns the wagons and hires a driver who furnishes the team and transports the children.

It becomes necessary in these cases for the district to decide upon the kind of wagon it is going to use in transporting its children. This depends somewhat upon the number of children to be conveyed and upon the kind of roads over which they are to be conveyed. In order that those having in charge the buying of wagons may have some idea of the kind of wagons that are being used throughout the country, the following facts as gathered from experienced men all over the United States are given:

The wagons used in Marion County, Kansas, are constructed especially for the transportation of children and are as comfortable and convenient as can be made. In the severe winter weather they are tightly covered and the beds and sides are heavily padded. The wagons used in the Burns consolidated school in the county cost when new $130.00. The wagons used in Ellsworth County, Kansas, are made especially for transportation purposes, have springs and are covered. The seats are arranged along the sides and the children enter from steps in the rear. The wagons used in Rice County, Kansas, have springs, leather tops and seats running lengthwise along the sides.

The wagons used in Dunn County, Iowa, are common wagons with band wagon boxes, home-made, water-tight cover and side curtains.

The wagons used in the consolidated schools of Woodford County, Illinois, are made especially for the purpose of carrying children and have springs. They are covered with heavy storm proof cloth and have seats arranged along each side.

In Marquette County, Michigan, a large covered bus is used. Those used in Kalamazoo County, Michigan, are provided with springs of the kind that are used for heavy farm wagons. They are covered with 20-oz. duck cloth and have seats arranged along the sides.

The wagons used in the Rigby consolidated school at Rigby, Idaho, are twelve feet long, five feet wide and weigh from 1100 to 1300 pounds each. They have the same type of springs as do modern dray wagons, such as are used in St. Louis for medium draying. They have the regular omnibus cover, the outside of which is made of leatherette. The seats are arranged lengthwise along each side and the children enter from the rear by steps provided with a guard along the sides.

The wagons used in the Jordan district, Salt Lake County, Utah, are the common western wagons, about No. 3. They are covered, have springs, and in cold weather straw is provided for the bottom of the wagon.

In North Dakota large covered wagons, like those shown in the picture, are used. The beds are covered with heavy canvas and the tops are painted in order to make them water-tight. They are provided with ordinary spring bolster springs. The seats are arranged lengthwise and the children enter through a door in the rear.

The wagons used in Pueblo County, Colorado, are covered with canvas, have springs and are made especially for transportation purposes. In district No. 7 of this county an ordinary farm wagon has been used to transport from twenty-five to thirty children for a distance of five miles to the central school. This wagon was covered with heavy canvas.

The wagons used in Cheshire County, New Hampshire, were purchased from the Delphi Wagon Works, Delphi, Ind., and from the Studebaker people. These companies manufacture wagons especially for this purpose.

The wagons used in the consolidated schools near Fairfax, Vermont, are of different sizes, depending upon the number of children to be carried. The seats run lengthwise along each side, are twelve inches wide and twenty inches apart, are from eight to twelve feet long and are covered with movable cushions. The back of the seats are also cushioned and extend upward for sixteen inches. The wagons weigh from twelve to fourteen hundred pounds and will carry from twelve to thirty children. The box that is used in winter has side curtains that will roll up. These wagons are made for the special use to which they are put and are covered with the best rubber cloth.

Most of the wagons used in Augusta County, Virginia, were manufactured especially for transportation purposes. In a few cases on very bad roads old type wagons are made by fitting them with canvas covers and providing upholstered seats along the sides. Bolster springs are placed under the body of these wagons.

In Idaho, Montana, Dakota, Minnesota, Wisconsin, and other northern states, the wagon bed is removed from the wheels and put on sleds in the winter when there is a snow.

From the above it will be seen that there is a large number of different kinds of transportation vehicles in use. The kind of wagon to be selected will in all cases depend upon the conditions peculiar to the district in which it is to be used, and upon the amount of money which the district is able to spend in this direction.

If the district is able, it is, perhaps, best to buy wagons manufactured especially for this purpose by wagon companies. Information concerning such wagons may be secured through representatives of the large wagon firms.

To repeat, in case the district does not desire to buy its wagons from a wagon company, it may place its order with some local mechanic and have them made according to its own plans. Or, it may employ a carpenter to construct wagon-beds, such as it desires, and may place these upon light farm wagons which have been fitted with bolster springs. In Granite school district, in Salt Lake County, Utah, the school board has found it desirable to furnish the springs and the wagon-box and to require the driver to furnish the running gears of the wagon. A good box together with the springs costs this district about $70.00.

In all cases the wagon should be covered. This may be accomplished by placing rubber cloth, leatherette, or other material over a frame made of wood. The wagon should also be provided with side curtains which can be rolled up. The seats used by the children should be arranged lengthwise along the sides of the bed, and steps should be provided by means of which the children may enter the wagon through a door in the rear.

DRIVERS.

After the district has secured its wagons, its next problem is to find suitable persons to drive them. Great care should be exercised in making this selection, as the driver has much influence over the children he transports. Almost as much care should be taken in selecting a driver as is taken in the selection of a teacher. Mr. Frank L. Jones, former State Superintendent of Indiana, submits the following opinion upon the matter of transportation contracts:

"I am not in favor of letting contracts for conveying pupils. It is not a matter which can be lumped off to the lowest bidder. It would be as sensible to employ teachers on this basis. The law does not contemplate that the contracts for transportation should be made in this way. It is entirely proper for a trustee or an advisory board, or both, to fix the amount that will be paid and then select the best man for the work at that price."

The driver must in all cases be under bond and contract as to regularity, habits, and protection and control over the children, as provided by law. It is generally best to have a uniform contract for transporting the pupils, which all drivers are required to sign. Such a contract assists in a clear understanding of what is expected of all concerned.

The form of contract used in Missouri is as follows:

SCHOOL CONVEYANCE CONTRACT.

District No. ......, ... County, Mo.

This article of agreement made and entered into this .... day of ...., 191.., by and between.................. ...., of .... County in the State of Missouri, of the first part, and the School Board of Consolidated (Common School) District No. .... of .... County in said State, of the second part.

WITNESSETH, that the said.............................. party of the first part, doth hereby agree to and with the said School Board, party of the second part, as follows, to-wit:

That the said .... will convey to school by spring hack all children herein stated.......................

and such other children of school age whose parents may later reside on the route or in the district. The transportation route to be as follows: ....
The said party of the first part further agrees to arrive at .... between ...... A. M. and...... A. M. standard (sun) time, and at the close of each day's session convey the foregoing pupils to their respective homes as expeditiously as possible in the same general manner as in the morning. He shall strictly prohibit profane or obscene language and boisterous conduct in or about the hack. The said party of the first part further agrees not to use tobacco while in charge of the children, neither will he permit its use by any of the pupils while in his custody. The pupils shall be conveyed with due regard for their comfort and the team shall not only be safe but reasonably speedy.

(Additional Considerations) ....
The services of the said party of the first part shall commence on the .... day of ...., 191..., and continue throughout the school year for such days as the school shall be in session. The said party of the first (second) part shall provide a comfortable and safe conveyance, and said vehicle shall be so constructed that it can be entirely closed during inclement weather.

(Additional Considerations) ....
The said party of the second part in consideration of the prompt fulfillment on the part of the party of the first part contracts and agrees to pay .... dollars per day for services rendered as above stated. In case party of the first part fails, neglects or refuses to faithfully do and perform each and every one of the covenants and agreements herein specified on his part to be performed, then this contract shall be void at the option of the party of the second part, and the party of the second part may immediately bring suit on the bond annexed hereto for any damages sustained to the party of the second part by reason of the failure of the party of the first part to perform his covenants and agreements herein contained.

IN WITNESS WHEREOF, the above named parties have signed the above contract.

Done by order of the Board this ...... day of .... 191..

.... } Party of the first part.

....
President.
....
Secretary.
} Party of the second part.

DRIVER'S BOND.

KNOW ALL MEN BY THESE PRESENTS, That ...., principal and .... as sureties, are held and firmly bound unto the State of Missouri in the sum of .... dollars, for the payment of which we do bind ourselves jointly and severally. The conditions of this bond are such that, whereas said .... did on the .... day of ...., 191... enter into a contract with the School Board of Consolidated (Common School) District No. ...... of .... County in the State of Missouri, we do hereby guarantee the full performance of all conditions specified in said contract on the part of said .... to be kept. Now if the said .... shall faithfully fulfill all the requirements mentioned, then this obligation to be void, otherwise to be and remain in full force.

WITNESS our hands and seals this........ day of............, 191....

.... (Seal)
.... (Seal)

Blank contract forms may be procured by writing to the Superintendent of Public Instruction, Jefferson City, Missouri.

DRIVER'S CONTROL OVER PUPILS.

The pupils should be under the supervision of the driver while being carried to and from the school. The driver should be able to command the respect of all the pupils in his charge. The following are some of the rules for pupils transported in wagons to and from school at public expense, used by the Jordan School District in Salt Lake County, Utah:

First. The driver takes the place of the teacher in discipline while pupils are in the wagon.

Second. Wagons are put on to accommodate the pupils who live two or more miles from the school. Then those living next in distance. If all can be accommodated, do so, if not, the smallest pupils on the inside of the two-mile limit shall have first place.

Third. Wagons shall call at regular and convenient places on route for pupils.

Fourth. Pupils must be on time, or the wagon will not wait for them.

Fifth. Time when wagon will be at certain points shall be given out by driver and he must be there at that time, but must not leave ahead of schedule time.

Sixth. While riding in school wagons pupils must be orderly and remain in seat given them by the teamster.

Seventh. Pupils must be careful in getting in and out of the wagons, to the end that they do not soil clothing of other pupils.

Eighth. Rules for the conduct of pupils in regular school shall maintain in the wagons. Principals of the schools to which pupils are hauled in wagons will be held responsible for the enforcement of these rules.

Ninth. Pupils must be respectful to teamster.

Tenth. Should a pupil persist in violating any or all of these rules, it shall be the duty of the driver to disqualify the pupil from riding and the pupil so disqualified shall not be permitted to ride again until permission is granted by the school board.

HEATING THE WAGONS.

The wagons used in the transportation of children are sometimes heated in cold weather. This is not generally necessary if the wagons are tight.

The consolidated schools in Salt Lake County, Utah, do not find it necessary to heat their wagons. Mr. C. H. Brush of Fairfax, Vermont, reports that the wagons are not heated in his part of the country, but that occasionally a parent sends along a hot brick wrapped in paper. In Baltimore County, Maryland, robes and blankets are found to keep the children warm, and so no device for heating the wagons is employed. Mr. A. M. Nutten, of Comstock Consolidated Schools, Comstock, Michigan, says: "We were prepared to heat our wagons, but never have found it necessary. The closed wagon filled with children doesn't seem to require heat." It has not been found necessary to heat the wagons in so cold a place as Richland County, North Dakota. This would seem to indicate that the heating of the wagons is more a matter of choice than of necessity.

If, however, a district does desire to heat its wagons, it may do this in a number of different ways. The wagons may be heated by oil stoves which can be purchased at any hardware store at a cost of about $5.00 each. In Marion County, Kansas, the wagons are heated in this way. In this county the pupils pay for the oil consumed as fuel in these stoves. These stoves are the Standard Oil Heaters. Soapstones or bricks of carbon, which are not very expensive and may be obtained from any large dealer in supplies, are often used. The Majestic Foot Warmer is sometimes used. These warmers cost about $2.50 each, but serve their purpose very satisfactorily.

BIBLIOGRAPHY.

1. Aswell, Jas B., State Supt. Pub. Ed., Baton Rouge, La. The consolidation of school districts, the centralization of rural schools and the transportation of pupils at public expense. Circular of information, 1906.

2. Barrett, Richard C. Consolidation of schools and transportation of children. Bien. Rep. Supt. Pub. Ins. of Iowa, 1901.

3. Bedichek, Una, and Baskett, Geo. F. The consolidation of rural schools with and without transportion. Bull. Univ. Texas, No. 96, 1907.

4. Biennial report, U. S. Com. of Ed. pp. 2581-4. Transportation of pupils to school. 1899-1900.

5. Carrington, W. T., State Supt. Pub. Schools, Missouri. The rural school problem. Mo. School Rep. pp. 4-11, 1902.

6. Consolidation of schools and transportation of pupils. U. S. Com. of Ed. 2:2353-2369, 1902.

7. Connor, R. D. W. Improvement in rural school houses and grounds. Pamphlet, Raleigh, N. C., 1900-1906.

8. Davenport, E. Consolidation of country schools. Univ. Ill. Bull., 1904.

9. Fairchild, E. T., State Supt. of Pub. Ins., Kansas. Ed. Com. Bull. No. 1, 1908.

10. Fall, Delos, Supt. Pub. Ins., Michigan. School Rep., pp. 5-34, 1901.

11. Fall, Delos. Consolidation of schools. Rep. Supt. of Pub. Ins., p. 9, 1902.

11a. Foght, J. W. The American Rural School.

12. Folsom, Channing. An inquiry concerning the conveyance of scholars in New Hampshire. 51st N. H. School Rep., pp. 271-292, 1899-1900.

13. Fowler, Wm. K. The consolidation of school districts: the centralization of rural schools. Pub. by State of Neb. Dept. Pub. Ins., 1903.

14. Gass, Howard A. 16th Mo. Rep. of Pub. Schools, 1908-1909.

15. Harvey, Mrs. H. Clay. School problems in Adair County. Bull. 1st District Normal School, Kirksville, Mo., 1908.

16. Harvey, L. D. Consolidation of school districts and transportation of rural school pupils at public expense. Michigan, Bull. No. 7, 1902.

17. Jones. Frank L. Ind. Rep. Supt. Pub. Ins., pp. 727-782, 1902.

18. Johnson, W. H. Annual Rep. of Jackson County Schools, Independence, Mo., 1907.

19. Jones, E. A., State Com. of Common Schools, Columbus, O. The centralization of rural schools in Ohio. Proceedings N. E. A., 1908.

20. Joyner, J. Y., Supt. Pub. Ins. Consolidation.—Work to be done and how to do it. N. C. School Rep., 1902-3 and 1903-4.

21. Joyner, J. Y., Supt. of Pub. Ins., N. C. Consolidation of districts. Ed. Bull. No. 1, 1902.

22. Joyner, J. Y., Supt. Pub. Ins., N. C. Official letters, etc., Consolidation of districts.

23. Kelley, Patrick, H., State Supt. Pub. Ins., Michigan. Consolidation of school districts in Michigan. Bull. No. 19, 1906.

24. Matson, Clarence H. Country schools.—The new plan Outlook, p. 981, Dec., 1902.

25. McKenzie, Hector. Concrete examples of consolidation of rural schools. N. D. Pubsh. by Dept. Pub. Ins., 1905.

26. Nelson, Frank, State Supt. Ins., Kan. The consolidation of rural schools. Kan. School Rep., p. 38, 1901-2.

27. Olsen, J. W. Consolidation of rural schools, and transportation of pupils at public expense. Bull. No. 1 Reprint Bien. Rep. State Supt. of Pub. Ins., Minnesota, 1902.

28. Pyne, R. A., Minister of Ed. Rep. Minister of Ed., Toronto, 1910.

29. Report of Committee of Twelve on Rural Schools. N. E. A., 1897.

30. Rep. U. S. Com. of Ed. 2:2353-2369, 1902.

31. Riggs, John F. Bien. Rep. Supt. Pub. Ins., Iowa, 1905.

32. Riggs, John F. Conditions and needs of Iowa rural schools. Bull. by Supt. Pub. Ins., 1905.

33. Southall, Joseph W. Consolidation and transportation. Va. School Rep., 1900-01.

34. Stone, Mason S. Cir. of Ed. Information No. 19, Dept. Ed. Vt., 1906.

35. Upham, A. A. Transportation of rural school children at public expense. Ed. Rev. 20:241, 1900.

36. Ustrud, H. A., Supt. Pub. Ins. Consolidation of schools in South Dakota, 1908.

37. Welch, W. W., Supt. Pub. Ins., Montana. Montana School Rep., pp. 13-20, 1902.

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A

EDUCATION SERIES
Volume 1. Number 3.

JOURNALISM FOR TEACHERS

BY

FRANK L. MARTIN,
Assistant Professor of the Theory and Practice of Journalism
University of Missouri

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I.—WHY TEACHERS SHOULD KNOW JOURNALISM.

GENERAL SCHOOL NEWS.

The school is a public institution and the teacher is a public officer. To the teacher are entrusted responsibilities far greater than are left to the average public officer—not the mere business affairs of the people, but the instruction, care and the moral and physical welfare of their children. In return, the teacher owes to the people, particularily the parents of the pupils in his charge, all information relating to the conduct of affairs in his school or special department, as far as this information is of general interest. Such information, *providing*, *always*, *that it is of general interest* to the parents and others in the community, and not of trivial, private or purely technical nature, constitutes news. It is news to which the residents of the community in which the school is maintained, are entitled indisputably.

Few teachers realize the eagerness of the reading public of today in any community, for news of the schools. That interest is vital because such news has to do directly or indirectly, with their children.

Editors of newspapers, generally, try to publish as much of this news as possible but they are, in most instances, handicapped in two ways: first, the number of newsgatherers and writers in their employ prohibits them from spending the time necessary for search and investigation, if the news is to be uncovered and published accurately; second, the limited knowledge of the average teacher as to what constitutes news or as to what information is of general interest and hence should go to the newspapers, prevents him from furnishing the desired information.

One obvious remedy would be for teachers to acquire at least an elementary, working knowledge of journalism. This would enable them to recognize and furnish news to the newspaper representatives, or better yet, to gather and write this news and submit it to the newspapers, themselves.

The publication regularly of news from any school must necessarily result in a closer relationship between that school and its patrons. It tends to arouse a greater interest in matters of education in the community and in the welfare and progress of the school.

EDUCATIONAL JOURNALS.

The many advantages in the interchange of ideas, methods, results of experiments and research work in the teaching profession, as well as any other profession, are widely known. If the educational journals designed to convey this information are to be of real service, then it is essential that the editors and contributors of such journals know the principles of journalism, at least the principles involved in writing and expression. Briefly, such knowledge must include methods in the assembling of facts for presentation; the ability to judge of the relative importance of such facts; ability to interpret and, above all, an ability to write clearly, concisely and understandingly.

The educational publications today, as a whole, are not serving their purpose. They are not being read. Those who are contributing with the worthy view of aiding their fellow teachers, are not presenting their information in a manner that attracts or compels reading. Although the teacher may have information that is of value, he may as well leave it unwritten as to submit it to the average reader without regard to the manner of writing and presentation. In many cases a careful perusal of articles in the educational journals, although intended by the author to reach those of his station in the profession, discloses a need of translation.

SCHOOL PUBLICATIONS.

The news or combined news and literary publications of many schools are issued under the supervision of the teachers. Such publications are an impetus to a school's interests and spirit, if properly edited and managed. It is not enough that they come from the printer grammatically correct, perfect as to English, etc. Again some journalistic knowledge is essential, both as to the nature of the material to be presented and the manner of its presentation. There must be direction or aim in their general make-up, if these school papers and periodicals are to have a hold on the students and accomplish a purpose.

NEWSPAPERS AS AN AID TO TEACHERS.

No citizen in any community is better fitted to become a leader in the affairs of his community than the teacher. The interests of that community are, or should be, as vital to him as to the banker, the merchant or any professional resident. The newspaper offers him the best possible means of assuming some of the responsibilities of such a leadership, providing he has the ability of expressing his views in writing.

Problems of health, administration of public affairs, public improvements, needs and conditions are some of the questions that every community must settle. Why shouldn't the teacher assume his share of a duty to society by taking part? Through the newspapers, he can point out, suggest and influence by writing articles prepared for that purpose, reaching hundreds where by individual effort he can reach only a few. More and more are the columns of the newspapers being opened for such articles, competently written. Never are they unwelcome by the editor who has the welfare of his community at heart. Newspapers now are reflecting not alone the opinions of the editors, but are inviting the expression of public opinion.

NEWSPAPERS IN THE SCHOOL.

The events of today which make history are of no less importance than similar events of yesterday. Such events are recorded daily and the reading of newspapers and periodicals should be urged by the teacher among his pupils. The papers should be wisely selected both as to character of contents and the manner of presentation.

There are few useful citizens who do not keep in touch with the affairs of his own community and at large. Training for such citizenship should begin in the school room. There is no better method than through the medium of newspapers—the intelligent reading and discussion of events and problems presented by them from day to day. In the selection of newspapers for such study, the teacher can best be guided by a knowledge of journalism.

BETTERING SCHOOL CONDITIONS.

Schools often lack in equipment; physical conditions need remedying and other things are at fault, sometimes, because of a lack of interest and support by the patrons. The teacher has at hand the local newspaper or newspapers, to arouse that lagging interest. Communications, well directed and ably written, pointing out the conditions and the improvements needed will do much in bringing the desired results. Publicity for existing conditions in most instances is all that is needed.

This is a day of newspaper reading. It cannot be denied that news, truthfully and well presented, is more widely read and has a wider influence than ever before. Not once but many times, perhaps, will it be necessary to call attention to these conditions. The newspapers offer the advantage of placing the same matter before the people day after day, until the constant emphasis has brought response.

II.—WHAT CONSTITUTES NEWS.

FOR NEWSPAPERS.

The writer of a series of articles on journalism recently sought from editors of successful newspapers in various parts of the country, their definition of news. No two definitions obtained were alike, yet all, when analyzed, agreed that "news, in its broadest sense, is that which is of interest to the people—the public."

In considering this, it should be remembered that information of interest to the public is distinct from that which is purely private or personal. Where the line shall be drawn rests with the teacher who is furnishing news of his school to the papers.

It is never possible to prophesy just what news will arise at any time, place or institution, yet in narrowing the field to school news, there are many events of a similar nature in nearly all schools, the details of which will be of interest to the readers in the community. A list of the more important of these is given here, although it may vary as conditions vary:

New courses of study.
Winning of prizes or honors.
Entertainments by pupils.
Debating contests.
Athletic contests.
Attendance.
New methods in teaching.
Experiments by students.
Improvements and added equipment.
Meetings of societies.
Lectures (outside of class room).
Commencement exercises.
Class meetings, activities, etc.
Rules governing discipline, study, etc.
Changes in teaching force.
Teachers' meetings.
Institute meetings
School board meetings.

The foregoing by no means covers the field of school news. There are many additional activities in connection with pupils, teachers and administration which should be productive of interesting material. These the teacher must learn to discern as the reporter learns to recognize the news in the great amount of information that daily comes to him.

The location of the school is one of the determining factors. In small towns or rural communities, the number of readers of the papers which may be supplied with school news is limited. The interests of these readers are centralized. In such places they are interested in the happenings and progress of one school, where in a large city their interests are diffused among many. For instance, a small entertainment in a rural community will be a matter of general interest. In the city it might be of interest only in the district from which the school gets its pupils. In the first case the news article could be worth, perhaps, 300 or 400 words, and in the last case it might be given merely a paragraph. If it is to be of general interest in the city paper, the entertainment must be of such magnitude as to interest the readers of the paper as a whole or, at least, a large portion. City newspapers are better equipped, however, for gathering the news of the schools and the smaller town or communities will be considered chiefly here.

In the gathering of information for a news story (story is the newspaper term applied to all news articles) there are no ironclad rules, but in the reporting of any event there are a few things that should be observed. Before one can hope to write or furnish a clear, comprehensive report, he must have all of the available information at hand. In this the teacher has the advantage of the average newspaper reporter, because he generally has charge of the matter to be reported or, at least, is present and is familiar with conditions. From all of this information he must sift out the unimportant and construct his story from that which he judges to be of general interest.

The teacher must remember that the most interesting reading is about persons. Hence the use of names is absolutely essential. Give the *name and initials* of every person connected in any way with the event. Before writing that name see that it is *accurately spelled.* There is no form of inaccuracy that is more dissatisfying than in the spelling of proper names and in incorrect initials. It is emphasis on details that tends to make the entire report accurate. Since the report has to do chiefly with those connected with his school, the teacher can easily verify all names by consulting his records. Where there is any chance of the reader not knowing, or a chance of confusion with some other person, identify the person named. If a pupil, tell where he lives and give the name of his parents. If a patron, give his occupation and tell where he lives.

All information should be specific. This means giving information in detail and without conjecture. The time and place should be specifically stated in every instance. Ages, too, are often an essential detail.

That some idea may be obtained of the information which the stories suggested should contain, each is discussed briefly here:

New Courses of Study.—Give a detailed explanation of these courses; why offered; what teacher is to have charge; the teacher's training; length of course; books used, or laboratory work; what other schools are offering them; what students are eligible; ultimate results from the instruction; story particularily applicable at the beginning of the school term.

Winning of Prizes or Honors.—Name of the winner; how won; what is the prize; who gives it and why; how many entered the competition; what was the work of the student; who were the judges and how was decision made; when presented and by whom; has it been offered in former years and who were the former winners? In cases where offered for best essays or debates, give titles and the treatment of subjects. Publicity of such events comes in the nature of a reward to the winner.

Entertainments.—Who gave it; why given (in case of a benefit); names of every person who took part; if a play, give the story and the cast of characters; if a program of recitations, etc., give in detail the part taken by each; attendance; if given by a club, give the purpose of the club and object of entertainment (in case of benefit).

Debating Contests.—Between what schools or classes; who won; subject debated; names of representatives and alternates; summary, at least, of argument of each side; names of judges; how did they vote; former contests between the schools or classes; training for the contest; the leaders of either side; attendance.

Athletic Contests.—Between what schools, departments or classes; who won; the score; how the points were made; the line-up (names of players and their positions on the team); names of officials; review of the entire game; detailed account of the important plays and critical stages, when the contest was in doubt; preparation for the contest; quality of the game (skill displayed individually or by the teams). In reporting any athletic contest it is essential that the teacher know the players and the details of the game. Without such knowledge, an accurate comprehensive story cannot result.

School Attendance.—Stories available at the beginning of each term; give exact figures showing the attendance in each class or department; compare with former years; give reasons for decrease or increase.

New Methods in Teaching.—Non-technical discussion of any changes or innovations in the manner of instruction in any subject; change of text, laboratory or material used; give reasons; show results expected.

Experiments by Pupils.—Stories available in laboratory or in practical training work; what the pupils are doing or making; under whose supervision; if laboratory experiment, give process, results and practical application; if manual training or work of similar nature give cost, time spent, tools, finished product, etc.

Improvements and Added Equipment.—These stories may include information of building, heating, sanitary improvements, etc.; new books, increased school room supplies, equipment for laboratories, gymnasium, etc.

Meetings of Societies.—Give nature of business transacted or action taken on any matter of general interest; report of speeches, by whom and on what subject; purpose of society and what matters are before it; officers.

Lectures.—Class room lectures are considered of a private nature. Special lectures arranged for the pupils as a whole, often given by outside speakers, should be reported fully. Give at least a brief sketch of the speaker, name, work, life, residence, etc.; include in the report every point touched upon by the speaker, even though in some cases only mere mention is made. Expressing only a few of the speaker's thoughts, where he has touched on many, does not constitute a fair or accurate report. Verify any question in doubt by consultation after the lecture, or by manuscript; if quotations are used, quote accurately, using speaker's own words as far as possible.

Commencement Exercises.—Names of all pupils who receive diplomas; give detailed account of program with names of those who took part, subjects, etc.; names of those who won honors, if any; reports of addresses by visitors; who presented diplomas;

musical program; description of decoration, flowers, presents; what graduates will do after leaving school, etc.

Class Meetings.—Note any action taken on matters of general interest; preparations or plans made for coming activities; election of officers; display of class spirit; discussions; social events arranged.

Changes in Teaching Force.—Name of teacher leaving; how long with the school; his new position; name and sketch of new teacher; where he has taught previously; what classes and subjects he will teach.

Institute Meetings.—These meetings are often productive of stories dealing with school problems, presented by speakers and papers. Many of these subjects are old to teachers but, in some cases, new and of interest to the public. Avoid those discussions that are purely technical.

School Board.—Matters of school administration, including expenditures, hiring of teachers, contemplated improvements, tax levy and similar things are of public interest. In small communities reports of the work of the school board often may be made best by a teacher.

Again attention should be called to the fact that much other material of news value will come to the teacher. Also, it should be known that every news event cannot be accurately or thoroughly reported by making that report answer a given set of questions made out beforehand, such as in the foregoing list. A reporter, for example, may be assigned to obtain the news of a fire. He starts his work with the idea that he is to write of fire damages and losses. Investigation may show that in the excitement of the fire there has been an $800 robbery of a safe in the building, while the actual fire damage has been only $10. His story then becomes a robbery story and the fire news incidental.

This is an extreme case, perhaps, when applied to school news, yet at any event such as a meeting, debate or athletic contest there may arise many unusual things of great interest that cannot be foreseen.

FOR TECHNICAL OR EDUCATIONAL JOURNALS.

The technical journal has two purposes: first, the presentation of school news that a teacher may know what is happening of a general news character in other schools over the state or country;

second, the presentation of school problems or discussions of questions and methods designed to aid the teacher in his work.

News suitable for a technical journal depends much on the circulation of the journal for which it is written. If it is a publication supplying information chiefly to teachers of one state, then the field is fairly broad. The news should deal with teachers and their work, emphasizing the personal side. Teachers of the same state are constantly thrown together through associations and state meetings, and form a wide acquaintance among those in their profession. Thus they learn to depend on the educational papers (the "personal columns" especially) to keep in touch with one another.

In addition to these personals (news items about teachers) there will be material for news in the new courses, changes, general progress, growth, or unusal incidents relative to instruction in your school. In furnishing this information, it should be remembered that all of the readers are teachers who do not live in your community, hence that "comumnity interest" in your particular school or the individual pupils is lacking. Instead, the interest is centered about you as a teacher, what you are doing as a teacher, or about general educational events in your school. As you should place emphasis on names of pupils and patrons in preparing news for the newspapers in your community, so in writing for educational journals emphasize the names of the teachers about whom the news is centered.

In technical papers of wide circulation the personal element is lost almost entirely.The happenings of your school become worthy of news only when they are of interest to teachers as a whole, who may be engaged in work anywhere.

In either class of these journals, the primary and chief purpose to be served, it would seem, is the dissemination of new methods and ideas helpful to the teacher. To serve this purpose the technical journal should carry to its readers such information on education matters that will enable the teachers to keep in touch and apply the best and latest there is in methods of instruction. It should be a forum for educational thought, ideas, theories, practice, suggestions and results. Every teacher should be a student of education and the results of his studies should be contributed to this forum. Those who receive information in this manner are obligated in a way to give in return whatever helpful information they, themselves, have.

Articles of a technical nature may treat of any plan or method, original or otherwise, that you have perfected and put into use, providing it is not already in general use and generally known. They may deal with any phase of educational work from the heating of a school building or the purifying of drinking water used, to a new method of giving examinations. They may be negative in context, serving as a warning to other teachers not to try methods or practices which you have found a failure after a thorough test.

FOR SCHOOL PAPERS.

The teacher in a high school who may have charge of the publication of a student paper, has the opportunity of making that paper serve a serious purpose: that of promoting the pupils' interests and creating a closer relationship among them. The first aim of such a paper should be to give the news of the school. This work, in itself, gives the pupils training in English, composition, observation and the obtaining of accurate information. As many are now issued, presenting columns of notes about trivial affairs, humor writing and burlesques, there is afforded little of this training.

The distinguishing mark of many of the school papers issued by pupils is flippancy, both in relation to the material presented and the manner of presentation. The aim of those publishing and writing, it appears, is merely amusement, rather than that of making the paper fill a need or serve a purpose for the school as a whole or for the pupils. No serious attempt is made to give a faithful or accurate report of school activities, the things which directly affect the pupils and the things which they are interested in most.

The teacher should see that the school paper gives its readers the essential news events of the school. Much of the news will come from the events already noted as suitable for publication in the community newspapers. Because of the limited circulation, it must be remembered that the interests of the readers are still more centralized, than in the case of the general newspaper. A report of a meeting of a society, for that reason, will give more of the minor details, than for a general newspaper, while an address which practically all of the students have attended, will have little news value for the school paper. For the general newspaper in the community, what the speaker said will be news to a majority of the readers.

The school paper may serve in arousing an interest in a coming lecture or meeting. This should be done by giving in advance as far as possible, or advisable, the character of the speech; something about the speaker; the purpose of the meetings and many other details. Many such events are unattended because the pupils and others do not know enough about it to decide whether or not they are interested.

Since all of the pupils are known to each other there is an opportunity for many personal items of news. This does not mean, as in the columns of many such papers, that the pupils are to be made the object of attempted witty or joking comment. That is a general practice that should be stopped by the teacher in charge. These news items may refer to a case of illness, a journey, entertainment of friends, breaking an athletic record, or many other similar things.

III.—THE PRESENTATION OF NEWS.

FOR NEWSPAPERS.

Every news or informational article of any length or importance, as a basis for discussion, at least, may be divided thus:

I.—The Lead (Introduction)
II.—The Body.

The Lead.—The general construction of a news story differs from any other sort of writing. That difference, in brief, is this: The climax (the paramount fact or facts; the essential thought of thoughts) is presented at the very beginning. It is not left for the ending or placed in the body of the story. The main motive in writing any matter for publication is that it shall be read. To accomplish this the information must be so arranged that it attracts and holds attention. Such matter placed at the beginning makes the lead to the story.

There can be no reason for confusing this style with the misused term of "sensational". What is commonly thought of as "sensational" is associated with the untruthful and the imaginary. Beginning a news article in such a way that it attracts means that you are to present first those facts or information which you judge to be the most important, interesting or unusual. Construct a story otherwise and you lose the opportunity of gaining the reader's attention at the start. He must search through the article to find the buried meat. Too often he will stop reading after finding nothing in the lead that appeals or interests. An accurate, direct statement of the facts or thoughts of the greatest general interest will attract that desired attention before anything else. Once obtained the careful presentation of other facts or details of less importance will hold it.

Just what material the lead of a story shall contain must be determined by the writer in accordance with the information that he has to present. Any attempt to give specific rules for the writing of a lead would be as futile as an attempt to dictate a style which would fit the writing of all news stories. Before writing, the teacher should analyze all information that he has at hand and consider it from every possible angle. That which he judges to be of the greatest general interest should go into the lead.

The following extract, in part, is an example of a poor presentation of an athletic contest, the work of a teacher:

> Before the boys from .... school came to meet us on the gridiron yesterday, there was a rousing meeting of the .... H. S. rooters in the assembly room. Speeches were made by the coach and members of the faculty and the spirit displayed was far beyond that seen here in many years. * * * * * The home team went on the field this afternoon determined to win. They played hard from the start but were at a disadvantage because of weight. * * * * At the end of the first half the score was 12 to 6 against the home team. In the last half our boys put up a spirited fight. * * * * * When the final whistle blew the home team had lost, the score being 24 to 12. * * * * * *

A careful consideration of the foregoing, which in full was more than a column long, shows that the information the reader desires most is not included in the lead but that he must "wade" through the much less important information to get it. The interesting news feature in this instance was not in the details of the mass meeting, an event incidental to the contest itself. Yet this information is given "the position of honor" while that of vital interest—what team won—is found near the end, almost the last informtion that the reader gets, in case he has gone that far into the article. Information in news articles are not arranged chronologically but in order of importance. While the mass meeting actually preceded the game, in the story of the two it should come last.

A lead, according to the information given, might have been in this form:

> The .... H. S. football players lost to their heavier opponents, the .... school team on .... field here this afternoon by a score of 24 to 12. The home team made a spirited fight for victory but was able to cross the visitors' goal line only twice. * * * *

Such a lead gives in direct, simple statements the result of the contest and a reason for the result. It might be followed by the most interesting details of the contest and other facts already suggested. The mass meeting should be told about last, unless alluded to in the story to explain the display of spirit.

Another example of a lead used in the report of a speech is given here:

> At a meeting of women here this morning in the rooms of the Woman's City Club, Miss Sylvia Pankhurst, the English suffragist, told of the suffrage movement. She told the members of the club that they were backward. * * * *

This lead contains the important facts but lacks a direct style of handling. Another writer who reported the event, improves it by making his lead tell more, even picturing the speaker as she made the statement. The second lead says:

> Miss Sylvia Pankhurst, the militant young English suffragist, shook her finger at seventy-eight members of the Woman's City Club this morning and told them that they were "backward."
>
> "I mean just what I say," she said. "The United States * * * * * *."

Attention is called also to the leads which begin: "A meeting was held"; "A party was given"; "The ———Club gave an entertainment", etc. The mere fact that the meeting was held is not the most interesting fact. In most cases advance notices have been printed and it is known that these events are to take place. What the readers want to know first is what happened. The most important happening at any one of these events comes in the lead. For example:

> Prof. John Jones will be invited to speak here. The .... Club, at a meeting last night in the high school auditorium, instructed its secretary, James Smith, to ask him to give a lecture to the pupils * * * * *

Or, in the case of a party where there seems to be nothing of special significance to pick out for a lead, avoid the monotonous beginning by grouping. Example:

> Forty persons heard a musical program and afterward danced last night at the home * * * * .

There is no definite length for the lead of any news story. It may consist of a single sentence, a paragraph or several paragraphs. The length is judged by the amount of space it requires to give the essential information.

The Body of the Story.—The body of the story will be expected to give, without repetition, the details of the information selected for the lead and additional information of secondary importance. Contrary to general belief the tendency of beginners or inexperienced writers, is to give too few details rather than too many. Their stories, for that reason, often are not complete or satisfying to the readers. The necessity of avoiding repetition of facts is an important one and can easily be avoided.

The additional facts carried in the body of the story should follow, in order of the degree of interest they incite. In the report of a program of speeches, for instance, you may decide that the most important talk is that of the third speaker. Having used this for the lead, you may follow with what the second or the fifth said, etc.

There is no "ending" to a news story as commonly referred to in fiction writing. A news story ends when you have presented all of the facts that are of general interest.

FOR TECHNICAL OR EDUCATIONAL JOURNALS.

Material for an article on educational matters, of interest to teachers alone, is technical "news". Its presentation, to be effective, must be the same as that of the general news story. The same plan is available for constructing the lead. The fact that such articles often deal with theories, problems and investigations, instead of more concrete happenings, does not in the least affect the manner of presentation.

As an illustration, a teacher has spent weeks, months or even longer in research work of a definite character· He has completed that work and desires to give his information to other teachers. He should present at the very beginning (in the lead) the problem investigated and the concrete results. The body of the article should contain every step worthy of note in his work leading up to the final result. The greater interest will be aroused and many more readers will be attracted if, at the start, it tells "what it is all about."

Again take an article dealing with a new method of teaching, which a teacher has devised and found expedient. The lead should tell *what* that method is; *how* it benefits and *why* it benefits. The part of the article which follows (the body) should contain a complete explanation (details of use, application, etc.) so that any teacher might put the method to a practical test. In such cases the body of the article may differ from that of a news story, since there should be a logical order of the various phases of the subject matter.

The following is a news story written by a teacher for a school journal:

> The .... Association of Mathematics Teachers held its annual meeting in the audience room of the Baptist church, Friday, October 21, at 2 p. m., the President, Mr. .... presiding.
>
> The central thought "what to emphasize and what to eliminate in high school mathematics" was carried out in the program.

Note in the foregoing how the lead is burdened with many unessential details which might well be left out altogether, or written after the important facts are given. The report of the program which follows would indicate that the "central thought" was that pupils should be led to *think*. This was buried deep in the article.

Here is a similar example printed in a school journal:

> At the meeting of the State Teachers' Association held in .... in October, the legislative committee appointed a year ago made its report to the association. In making its report and recommendation, the committee adopted the very sensible plan of confining its efforts in the next legislature to a few important measures, feeling that these, if enacted, would greatly increase the efficiency of our schools, and more would be accomplished than by attempting any sweeping or radical revision of the school laws at this time. The committee made recommendations on the following subjects. * * * *
>
> We present below the recommendation of the committee on the first and third of these subjects, feeling that these facts * *.

One learns from the foregoing lead that the association met and heard a committee report. If the principal event of the meeting was this report, then the essential news feature would be "what the report said." Trivial details must be read before this point is reached There is lacking, any direct, definite statement of fact in the lead. There is nothing that attracts.

In writing a discussion on the value of teaching agriculture in the public schools, a teacher, in an article for a school journal, first gives a history of the study of scientific farming· This is followed by various matter which showed that the writer had been investigating the subject for some time. At the end of the article he presents the results of that investigation:

> More can be done when the country school has as a part of its plant, a farm of a few acres where the best agricultural ideas shall be executed. The best way to make a boy a good farmer is to have him grow up in the midst of good farming.

The writer apparently was striving for a good "ending". It is quite probable that the majority of the readers did not pursue the article far enough to enjoy that ending.

In the treatment of all technical subjects, emphasis must be placed on details so that the reader may have no trouble in understanding the matter clearly. Remember that your information is especially beneficial to the younger and less experienced teachers. They will be unable to make use of it unless it is presented to them clearly and explicitly.

FOR SCHOOL PAPERS.

Eliminating the literary publications, the magazines and class annuals, every paper issued by the pupils of a school is primarily a newspaper. The methods suggested for the presentation of any news stories is applicable to school papers.

In the material, in the presentation, and in the writing the pupils often fail to realize any sense of responsibilty. Few realize that any publication may do much harm through the indiscriminate, unthinking methods of using, presenting and writing information. Here the teacher should use a guiding hand.

IV.—WRITING THE NEWS AND TECHNICAL ARTICLE.

Effective writing in presenting information or ideas, consists in constructing concise, attractive, smooth-reading articles; articles that point out definitely facts, conditions, events or thoughts as the writer sees or knows them. There can be no rules to govern any individual article, yet there are general principles governing writing of this nature.

Simplicity.—In grammatical construction and general style, simplicity best serves the purpose. Use short, simple, crisp sentences rather than the long, involved construction. This will give the desired quality—terseness. Use, also, the short, common words where these words will express the exact meaning· Particularly in the writing on technical subjects is there a tendency to use so many technical terms that only a few who have made a study of the same subject will understand. With the simple forms and words your information will reach many it otherwise would not, and will bring greater results.

Most of the technical articles written on educational or other subjects "go over the heads" of the readers. Why should a teacher of agriculture, who has suggestions helpful for a farmer, write in such a way that the average farmer (the very one he desires to reach) cannot understand him? Why should a physician write for the people at large, of the ways to prevent disease, when his technical terms and manner of presentation prevents them from understanding? Why should the teacher who has specialized in educational methods write so that the average teacher cannot understand?

Originality.—Avoid a sameness in expression. An original turn to the lead, or in the writing as a whole, never fails to please. Originality in writing prevents the article from becoming what is known as "dry reading". It includes the omission of trite phrases and expressions, mottoes or proverbs that have been overworked.

Examples:

Brilliant speaker.
Well known.
Large and enthusiastic audience.
Largest crowd ever assembled.
Hardest fought game.
Charming hostess.
Admiring friends.
Breathless silence.
Evening repast.
Fair sex.
Few and far between.
Host of friends.
News leaked out.
Sole topic of conversation.
Leave no stone unturned.

These are only a few of many expressions that are now time-worn. They represent the type of expressions that have been used so constantly and so long that they now pall on the reader.

Compression.—Remember that the space of newspapers and technical journals is limited. Compress your facts as much as possible. Make every word, every sentence tell something, yet keep the meaning clear. This applies both to expression and words. Where one word will do for three or four then use that one word. These may serve as illustrations:

To (or for)—for the purpose of.
Escaped—made his escape.
Burned—destroyed by fire.
About—in the neighborhood of.
Feel—experienced a sensation.
Appeared—put in an appearance.
Went—made his way.

In a similar way writing may be condensed by substituting the short, simple word for the longer equivalent. Thus:

Talk—converse.
Show—demonstrate.
Pay—remunerate.
Live—reside.

Clearness.—No writer can expect to express himself clearly without first having his information or ideas clear in his own mind. Clearness involves the correct use of the English language, words and terms. There can be no excuse for the reader being in doubt as to the author's intended meaning, either through the writer's lack of knowledge of his subject, or inability to express himself clearly.

Naturalness.—Some writers become frightened when they think of seeing their article in print. The result is they strain for effect and their writing becomes stiff and formal. A fact stated simply and naturally is far more effective than any elaborate combination of words or phrases. Write as you would tell it in conversing. If you have some information to tell, in talking, you start with the important and follow with the details, always using the simple expressions—that is natural. If more persons wrote as they talked there would be more readable, and brighter articles.

Use of Direct Discourse.—Often the use of direct discourse is effective in reproducing the thoughts or sayings of others, but the exact words (at least the important words which have any bearing on the meaning) should be used. Where there is any doubt as to these words, use indirect discourse. The essential value of direct discourse is that it gives the speaker's views much more forcefully, hence it is needed only when expressing something quite unusual or important. The use of quotation is commonly used in beginning the report of an interview or speech· There can be no serious objection, if the quotation is accurate, but such a method should be reserved for statements of great importance rather than ordinary ones.

Editorial Comment.—In writing news the writer should present the facts and allow the reader to form his own opinions. There may be included interpretation of the facts, since the writer is supposed to be familiar with conditions, but there is no reason for his personal opinion or comment. The editorial "we" so often used by beginners is no longer found in the news columns. If it is desired to show the general effect of a news event, then there may be written the opinions in interviews of others, or of those who witnessed it, giving the general impression the event has made—but that is interpretation. For the personal comment of the editors, or contributors, the editorial page is open, or comment may be expressed aside from the news itself, through communications.

The use of comment applies particularly in reports of entertainments, plays, etc. Criticisms should be written only by those who can qualify as an expert. Remember, also, that such terms as: "Young man of sterling qualities", "most pleasing rendition" (and many others) are used generally to flatter.

Articles and discussions on technical subjects, however, may be expected to contain comment. In such writing the chief purpose of the article is instructional and there can be no valid objection to the opinion of the writer who has studied his subject.

Personality of the Writer.—The personal pronoun "I" has been eliminated now from the news columns, unless it is a signed article. The readers are interested in the news, itself, and not you or how you obtained it.

"Coloring of Facts."—No matter how trivial, or harmless it may seem, any use of imagination in supplying facts is dishonorable in writing any informational article· The reader accepts such articles as truthful and accurate presentations of facts.

Extravagant Phrases.—Avoid as far as possible the use of comparisons, figures of speech and a too frequent use of adjectives. They are generally found in the attempts at "fine writing", not in the simple style. Examples:

> The ground was covered with a *white mantle of snow.* (figure of speech).
>
> What might have been one of the most disastrous fires that ever visited * * * . (Extravagant expression)
>
> Beautiful, sweet scented flowers, marvelously transformed the cosy apartments * * * . (Extravagant through the use of adjectives).

Here are examples of adjectives often used, although meaningless because they are trite or unnecessary:

> Sad news of death—news of a death is always sad.
>
> Prominent farmer—indiscriminate use has made the adjective meaningless.
>
> Rising young lawyer—trite.

Generalities.—Writers sometimes make the mistake of expressing themselves in general terms. This results in giving hazy, indefinite information. Such expressions as "many," "few", "a number of" and "several" should be used sparingly. Other examples of indefinite expressions are:

An old man—give his age.
On Broadway—give number or location on street.
Lives in the country—give direction and miles.
A long distance—give the number of miles.
Eating fruit—tell what fruit.
Tiny lad—give age or size.

Use of Words.—The proper use of words aids in insuring accuracy, clearness and originality. Always use that word which gives the exact meaning desired. Many words possess individual shades of meaning, although they are commonly thought of as synonymous. The following will serve as examples:

Home, house—Home conveys the deeper meaning, that of the life within. House may be properly used when the writer has in mind only the building.

Believe, think—Believe denotes careful study or consideration. Think implies a conclusion without either.

Leave, depart—Leave requires an object. Smith left the city for the East; Smith departed for the East.

Haste, hurry—Haste merely implies speed. Hurry implies speed with attendant confusion.

Many words are used every day incorrectly in newspapers and other publications. Such words show a lack of care on the part of the writer. Examples:

Suspicion—noun only.
Loan—noun only, the verb is lend.
Over—incorrectly used for more than.
Occur—things occur by accident.
Take place—things take place by design.
Dirt—used incorrectly for earth.
Curious—used incorrectly for odd.
Burglarize—not a good word.
Groom—incorrectly used for bridegroom.
Claim—incorrectly used for say or assert.
Awful—rarely conveys the meaning intended.
But—incorrectly used for only.
Party, parties—incorrectly used for person or persons.
Locate—incorrectly used for find.
Given—write: A watch was given to Smith; not Smith was given a watch.
Graduated—write: Smith was graduated; not Smith graduated.
Divine—not a noun.
Grow—incorrectly used for become.
Alleged—incorrectly used for say or assert.
People—incorrectly used for persons.
Secure—incorrectly used for obtain or procure.
During—carries the idea of continuity.
Past—write: last week, not past week.

Preparation of Copy.—Before submitting copy (in newspaper offices and in the offices of most other publications all manuscript is known as copy) the writer should read it over carefully for corrections. Although the copy may be read by copy readers or editors, before it is published, this reading after it is submitted, is done more as a check on the writer and to judge the subject matter. The writer must prepare his copy on the theory that it is to go direct from him to the printer, perfect as to English, punctuation, quotations, etc. Here are a few general rules that should be followed in preparing the copy:

Use the typewriter whenever possible.

Use double or triple space on the typewriter.

Write your name in the upper left-hand corner of the first page. Number each page.

Leave a margin of at least an inch and a half at the left, and begin your story about the middle of the first page.

Write only on one side of the paper.

Indent for paragraph half the width of the page.

Never divide a word from one page to another. Avoid dividing a word.

Do not write over figures or words. Scratch out and rewrite.

Do not fasten sheets of copy together.

Be particularly careful, if obliged to write long-hand copy. Underscore *u* and overscore *n* when there is any chance of confusion. Likewise, underscore *a* and overscore *o*. Print proper names and unusual words.

When pages are inserted, use letters. For example, between pages 3 and 4 number the inserted pages 3a, 3b, etc.

A circle drawn around an abbreviation indicates the word is to be spelled out. A circle around a spelled-out word indicates it is to be abbreviated.

Use an "end-mark" to indicate your story is completed. A cross made of parallel lines may be used.

When there is any chance that a word intentionally misspelled, as in dialect, will be changed by the printer, draw a circle around the word, run a line to the margin and there write "Follow Copy." This will show that the copy is not to be changed.

English.—That style of writing sometimes referred to as "newspaper English" is fast disappearing from the progressive, well-edited newspapers. Express yourself in plain English and avoid the set forms. Unfortunately, through a similarity in the character of the news presented from day to day, there are still in use in some papers stereotyped, hackneyed expressions. They are barred from the better class of papers. Some examples, most of which would come under the head of trite, are given here:

A *rumor has it* that the *minions of the law will put in their appearnace* : :

The *scene beggared description* when the *rising young barrister, white as a sheet,* arose : : : : : :.

The flames *spred like wildfire* and the *unfortunate victims* in the *wildest of excitement* : : : :

Details of Style.—No uniform rules regarding details are used by all newspapers and periodicals. These rules, however, are taken from the "style books" of the best edited newspapers and may be safely followed:

CAPITALIZATION.

Capitalize:

Names of associations, societies, clubs, companies, etc., as Glee Club, Odd Fellows, Payne-Roth Grocery Company, National Association of Advertising Managers, Columbia Club.

University, college, academy, etc., when part of a title, as University of Missouri, Central College. When not connected with a name use lower-case, except in reference to the University of Missouri, which is to be distinguished as the University.

Building, hall, house, hotel, etc., when used with a distinguishing name, as Athens Hotel, Nowell Building, Columbia Theater.

Names of all political parties, as Democratic, Republican, Socialist.

Principal words in titles of books, plays, addresses.

Titles when preceding the name, as President Hill, Doctor Jones. But use lower-case when the title follows the name, as Doctor Hill, president of the University.

Distinguishing name only referring to wards, streets, avenues, railroad stations, mines, etc., as North Ninth street. Third ward, Wabash station, Yellow Dog mine.

Specific names of courts of record, as Boone County Circuit Court, Kansas City Court of Appeals, Missouri Supreme Court, but use lower-case when qualifying name is not given, as the circuit court, the supreme court.

Holidays, as Fourth of July, Columbus Day.

Sections of the United States, as the North, the West, the Middle West, North Atlantic States.

Nicknames of states and cities, as the Buckeye State, the Hub (Boston).

Names of all races and nationalities except the negro, as Italian, American, Indian.

The name of a bill, act, amendment, etc., as Good Roads Bill, Eleventh Amendment.

All names and pronouns referring to the Deity.

Such names as First Regiment, Company B, National Guard, Grand Army of the Republic, Missouri State Militia.

President when referring to the President of the United States, and titles of all national cabinet officers, but do not capitalize city councilman, chief of police, sheriff, etc., unless they are used before the name.

Nation, Union, Republic, Federal, National, etc., in reference to the United States.

North Pole, South Pole, South Sea Islands, Cape Hatteras, Hudson Bay, Mississippi River, and all such words when they are used as a specific name.

The names of such notable events and things as the Declaration of Independence, the War of 1812, the Revolution, the Government (referring to the United States), the Spanish-American War, the Reformation, the Civil War, the Confederate States.

Bible and words that refer to it, as the Book of Books, the Scriptures.

Congress, House of Representatives, Senate, Assembly, but use lowercase when title is not official, as lower house, legislature, both houses.

King and all titles of nobility referring to specific persons, as King of England, Duke of Wellington.

Such terms as Stars and Stripes, Old Glory, Union Jack, White House.

The names of all religious denominations, as Baptist, Quaker, Mormon, Methodist.

Distinctive names of localities in cities, as West End, Happy Hollow, Back Bay (Boston), etc.

Church, when used in a specific name, as the First Baptist Church.

Do Not Capitalize:

Name of seasons.

Degrees when they are spelled out, as bachelor of arts.

Points of the compass, as north, south.

Postoffice, courthouse, poorhouse, council chamber, city hall, armory, president's house, navy, army, cadets, fraternity (as Phi Delta Theta fraternity), justice's court, police court, women's parlors.

Professor, unless preceding a name.

Club, society, company, etc., when not used with a specific name.

Senior, junior, sophomore, freshman. (And remember the adjective form of freshman is freshman, not freshmen.)

PUNCTUATION.

Do no use period after per cent.

Run lists of officers thus: President, John Jones; vice-president, Henry Smith; treasurer, John Brown.

In lists of names and addresses use this style: John Jones of Kansas City, A. W. Brown of Mexico, Mo., and Fred Smith of Scranton, Pa. Where more than three names are given, drop "of" before name of city, thus:

John Jones, Kansas City; A. W. Brown, Mexico, Mo.; Fred Smith, Scranton, Pa.

Use no comma in 5 feet 8 inches tall, 3 years 6 months old, etc.

Give scores thus: Missouri 8, Kansas 5.

In summary of athletic events use this style:

100-yard dash—Smith first; Jones, second; Brown, third. Time, 0:10 1-5.

Do not use comma before the conjunction "and" in a series, such as Fred, James and Henry.

Use colon before a quotation of more than one sentence and always when quoted matter begins a new paragraph. Use colon before a series introduced by "as follows," "thus."

QUOTATION.

Quote titles of books, plays, paintings, operas, songs, lectures, sermons, etc. Be sure to include "the" in the quotation if it is a part of the title, as "The Scarlet Letter."

Do not quote names of newspapers and periodicals.

Do not quote extracts that are indented or set in smaller type than the contezt.

Do not quote the names of balloons, cars, steamships, horses, dogs.

Do not quote the names of characters in plays or books.

FIGURES.

Use figures in giving ages, as 17 years old.

Use figures for sums of money, as $3.87, unless an indefinite sum is mentioned, as a dollar, about five hundred dollars.

Use figures for all athletic records, as a pole vault of 10 feet 2 inches.

Use figures in all matter of a statistical or tabular nature.

Use figures in giving time by the clock, as 10 o'clock, 10 a. m.

Use figures for street numbers, as 10 West Broadway.

Use figures for dimensions, votes, per cents, calibers, dates, degrees of temperature, betting odds and bond terms.

In all other news matter spell out definite numbers up to 100; beyond that use figures. Exception—When a number of two figures occurs in proximity to one of three or more, both shall be put in figures, as 60 women and 741 men.

Spell out all approximate numbers, as nearly a thousand, a dozen, three or four hundred, half a million.

ABBREVIATION.

Abbreviate Sr., and Jr., following names. Write thus: John Smith, Jr.

Abbreviate names of states when used after name of town or city, as Columbia, Mo. Observe this style: Kas., S. D., Ok., Cal., Colo., Ariz., N. D., Pa., Neb., Wash., Mont., Wyo., Ind., Ia., Ore., Tex. Do not abbreviate in Fort Worth), mount (as in Mount Vernon).
Maine, Ohio, Idaho, Utah, Alaska.

When used before the full name abbreviate Dr., Prof., the Rev., as Dr. J. C. Jones, Prof. W. A. Smith. Spell out when used before the surname only, as Doctor Jones, Professor Smith.

Always use "the" before the title Rev., as the Rev. William Brown; if surname only is used, make it the Reverend Mr. Brown. Usually it is sufficient, after the full form has once been used in the story, to say Mr. Brown.

Always spell out per cent, street, avenue, railway, brothers, fort (as

Spell out names of the months, except in date lines. Always spell out names of the days.

Never abbreviate proper names, as Jno., Geo., etc.

Spell out military titles, as colonel, lieutenant, general.

Abbreviate Mr. and Mrs., Mme., Mlle.

Spell out names of the political parties, except in giving election returns.

Spell out governor, superintendent, president.

Use this style in referring to a company: The James Smith Baking Company, or James Smith & Co., bakers. In railway use long "and," as Chicago and Alton.

Abbreviate the word "number" when followed by numerals, as No. 10.

Class of '04 may be used for class of 1904.

Never use "Xmas" for Christmas.

Use Y. M. C. A. and Y. W. C. A., not Young Men's Christian Association and Young Women's Christian Association.

Spell out United States, except when it occurs as part of title in navy or army, as Lieutenant James S. Smith, U. S. A., or Lieutenant James Smith, U. S. N.

Do not abbreviate names of cities, as St. Joe for St. Joseph.

TITLES.

Do not use Mr. when initials or Christian name are given. The second time the man is mentioned in your story use Mr., unless he has another title, such as doctor, professor.

Do not use Master in referring to a boy.

Do not use Esq. following a man's name.

Do not use Honorable, unless it is a title bestowed by Great Britain.

When a person has more than one title use that of the highest rank, as Dr. James Smith, rather than Prof. James Smith. If he has (rightfully) two titles, as Judge and Colonel, use the one last acquired or the one more commonly used by his friends.

Write James Smith and Mrs. Smith or Mr. and Mrs. James Smith, not James Smith and wife.

Do not write the Rev. James Smith, D. D., or Dr. James Smith, M. D.

Use Mrs. before the name of a married woman; Miss before the name of an unmarried woman. In giving a list of married women it is permissible to precede it with Mesdames; Misses before list of unmarried women, always using Christian names or initials.

THE POSSESSIVE CASE.

To form the possessive case of a proper noun ending in s, add an apostrophe and s, as James's book.

To form the possessive of a plural noun already ending in s, add only the apostrophe, as soldiers' rifles.

Never use an apostrophe before the s in ours, yours, hers, its or theirs.

MISCELLANEOUS.

Never begin a sentence with figures. Spell out, or recast the sentence.

Say 40 years old, not aged 40 years.

Say former Judge, not ex-Judge.

Write dates thus: December 23, not December 23rd.

Omit the name of the state after large cities, as New York, Chicago, Boston, Kansas City, St. Louis, Denver.

Do not use a long, cumbersome title preceding a name; put it after the name, as John Smith, keeper of the seal.

Do not make a title of a person's profession or occupation. Say Smith, a barber, not Barber Smith.

Do not use foreign words or phrases when English will do as well. "A dollar a day" is better than a "a dollar per diem."

Don't spell forward, backward, and similar words with a final s.

Don't use the word lady for woman, or gentleman for man.

Use foregoing instead of above as an adjective; as the foregoing statement.

Use this style in giving time: At 5 o'clock yesterday afternoon; putting the hour before the day.

Don't forget to end quoted matter with quotation marks.

Don't overwork "on" before names of days, as on Wednesday, on tomorrow.

Don't overwork "for" in phrases such as for three days, for six years.

Study Newspapers.—By studying the news stories and other articles printed in the well-edited newspapers the teacher can gain many ideas both as to the way material is presented and the writing. A careful selection of newspapers should be made however, for there are poorly written newspapers, just as there are poorly written books.

Writing of Headlines.—In submitting copy to newspapers or technical journals, it is not necessary for the author to write the headlines. Each publication has its own style of headlines for use on articles, varying in respect to their importance, length and position

The teacher, however, who is directing the publication of a school paper, may have to select styles of headlines for that paper and write them. Headline type is always larger or blacker than the type in which the article itself is printed. The teacher should consult the printer and make the selection of the size and style in which the type is to be set. There are presented here three styles of headlines that might be suitable for a school paper:

23 to 25 units.	No. 1 **FIFTEEN LECTURE AT ONCE**
12 to 15 words.	Program So Full That Visitors Cannot Attend All Numbers—Opportunity for Specialization.
26 units the limit.	No. 2 MAY PAVE UNIVERSITY AVE
35 units in top line. 8 to 10 words.	Resolutions for Improvement Are Passed by City Council.
34 units. the limit.	No. 3 Knights of Columbus Meet.

It can be seen readily from the foregoing that the writing of all headlines must conform to typographical rules. The writer must know how many letters and spaces (units) will go in each line used. In the mechanical writing these rules should be followed:

> Count spaces as well as letters. Each letter counts one unit, except I, which is one-half, and M and W, which are one and one-half each.
>
> Never divide a word in the top deck of a head, nor in any other line set in caps.
>
> Capitalize all nouns, pronouns, verbs, adverbs, adjectives and interjections
>
> Capitalize all words of four or more letters.
>
> Capitalize all forms of the verb to be, as was, is, am.
>
> Capitalize both parts of compound words.
>
> Capitalize a preposition when it is attached to the verb, as in the sentence: He was Voted For by His Party.

Headlines are not used merely to separate the various stories on a printed page. They are designed: (1) to attract; (2) to tell what the story that follows is about. Just as in writing a lead, the writer should put into the heading the essential news fact or facts. There should be no mention of anything that is not contained in the story itself, and there should not be editorial comment.

THE
UNIVERSITY OF MISSOURI
BULLETIN

A

EDUCATIONAL SERIES
VOLUME I NUMBER 4

GEOGRAPHY OF MISSOURI

BY

FREDERICK V. EMERSON
Instructor in Geology
University of Missouri

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December, 1912

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GEOGRAPHY OF MISSOURI.

Geography, like history, is never finished. As long as the people of Missouri adapt themselves in various way to their geographic environment, so long will the content of the geography of the state change. The object of this bulletin is to awaken interest in the geography of one of the most interesting states from a geographic point of view, and to increase the appreciation and study of the content of Missouri's geography.

The current idea of geography makes it the science that treats of the earth as the **home** of life including the distribution of things upon the earth's surface and the reasons for this distribution so far as they are controlled by earth factors. Looking at this concept of geopraphy, it is seen that there are two main factors, the inorganic and the organic, or, in other words, the physical and the life factors. For our purposes, the physical factors consist of the earth, its surface, drainage, rocks, minerals and soils; the air, its temperature, moisture and movements, or, in short, climate. The organic factors are the people of Missouri who have at different times and in various ways been influenced by their geographic environment. To take a concrete example which will be elaborated later, the Missouri River, a navigable stream, was a factor to which the settlers responded by using it for communication and by locating in a narrow zone along the river.

In taking up the geography of Missouri, the rocks of the state will be briefly described and then the surface and the factors which have produced the surface, and the soils will be discussed. These, together with the climate, constitute the inorganic side of the state's geography. The settlement and development of the state with especial reference to these factors will next be taken up.

I.—ROCKS OF MISSOURI.

The Bed Rocks.—With the exception of a small area, most of the rocks in Missouri are **sedimentary**, that is, they were first deposited in water as mud or sand or gravel and subsequently hardened into rock. Evidences of this origin are found in several characteristics. The **stratification** by which many rocks are found in layers or strata is due to the sorting of materials by streams or currents. It is especially characteristic of shales and sandstones. Marine fossils are often found in sedimentary rocks. Ripple marks made at the bottom of shallow water, and sun cracks made by the drying of sand or mud are found in old rocks as well as in the sand

and mud along our streams, and indicate unquestionably the water-laid origin of the rocks.

The general sequence of the rocks in the state is shown in the section, Figure 1. Older rocks, underlie the younger. It should be remembered that this section is generalized and will not anywhere be found entire.

Most of the rocks of Missouri belong to the Paleozoic period. The oldest sedimentary rocks (Cambrian) were deposited on the old floor of pre-Cambrian igneous rocks which is for the most part deeply covered and reached only by a few deep wells. For most of this and several succeeding periods, the Mississippi basin adjacent to Missouri was for the most part a great sea in which the Cambrian, Ordovician, Silurian, Devonian and Mississippian rocks were deposited. The rocks of these periods are largely limestone, although locally there are considerable beds of shale and sandstone. From the geological map (Figure 2) it is seen that the Devonian is a thin, discontinuous bed of small importance. After the deposition of the Mississippian limestones, much of the region was elevated and the sea partly withdrew. The Pennsylvanian period was a time of oscillations. The lands were low and level, and slight changes of elevation altered the position of the shore line, now converting the region into land and again into swamps and shallow seas. The swamp conditions favored the accumulation of the coal measures whose origin will be briefly discussed in another chapter. The Pennsylvanian rocks are largely shale and sandstone with considerable limestone.

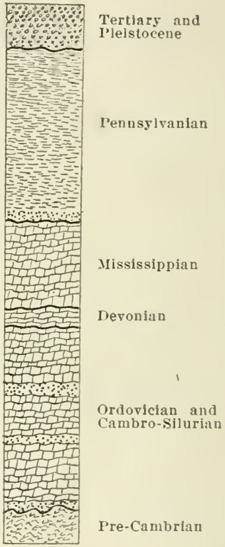

Fig. 1. Ideal geological section of Missouri. (after Marbut. (16a)

After the deposition of the Pennsylvanian rocks, most of Missouri was elevated and probably remained permanently above the sea. In the Tertiary period, which is relatively very recent, south-eastern Missouri was at the northern end of an embayment which extended far southward and in this arm of the ocean the Tertiary sediments which now underlie the south-eastern lowlands, were de-

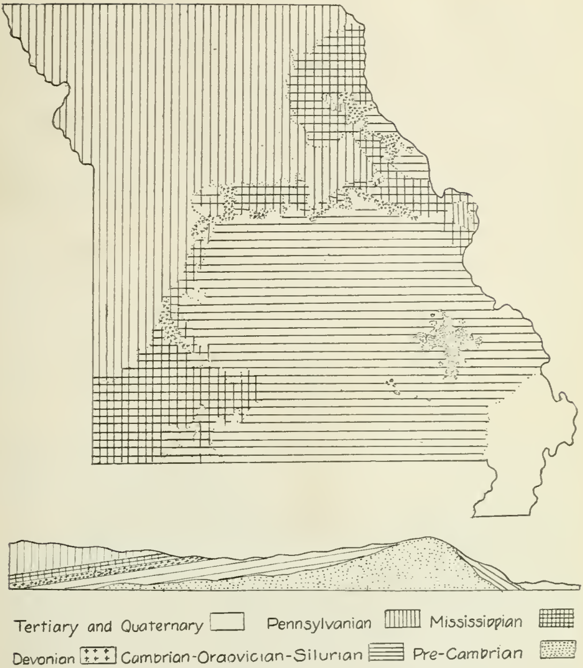

Fig. 2. Geological map and (northwest—southeast) section of Missouri.

posited. The Tertiary sediments are sands, gravels and clays, and are generally overlain by recent river deposits.

In the Tertiary period the rocks of the Ozark region were subjected to a gentle folding with the greatest uplift in the St. Francois Mountain region. This folding produced a dome-like structure with the rocks gently dipping in all directions from the center (Figure 2). In consequence of this uplift, erosion was accelerated with the result that the overlying rocks were stripped from the Ozark dome. The erosion was long and vigorous so that hundreds of feet of rock were removed and in the area of greatest uplift the old pre-Cambrian floor of igneous rock is exposed. The process, indeed, is still in progress. The Pennsylvanian in all probability once extended across the Ozarks, but has receded scores of miles from the center of uplift. The uplifted edges of the various formations are being worn back from the center, not evenly, but irregularly, retreating more rapidly where erosion is most vigorous. Hence the geological map shows boundaries that are irregular but not so irregular as a more detailed map would show. Frequently an uneroded area is separated from the main body of rock and left as an outlier; for instance, Kings Mountain, in Howell County, remains to tell of the former extension of Mississippian rock, the main mass of which is now far to the westward.

Mantle Rock.—Overlying the bed rock is a layer of material generally loose and unconsolidated, so thick that in many places the bed rock is rarely visible. This is the mantle rock, or, as it is sometimes indefinitely called, the soil. This mantle rock may result from the decomposition of underlying rock (residual) or it may be transported from other places (transported). Any rock exposed to weathering will break up, the soluble parts disappearing and the relatively insoluble parts remaining as mantle rock. Heat and cold expand and contract the rock and freezing aids the general process of breaking up rock. Rain and ground water dissolve the more soluble constituents. Plant roots penetrate rock crevices and decaying plants yield humic acid which aids in rock disintegration. These are the principal agents of weathering.

A disintegrated granite yields mainly quartz and clay. Some igneous rocks of the St. Francois Mountains are so free from quartz that they have yielded considerable beds of pure clay. A sandstone, the cement of which is dissolved. yields sand. A shale usually yields clay with varying proportions of sand. A limestone, no matter how pure, contains some clay which remains after the rock is disintegrated. In Mis-

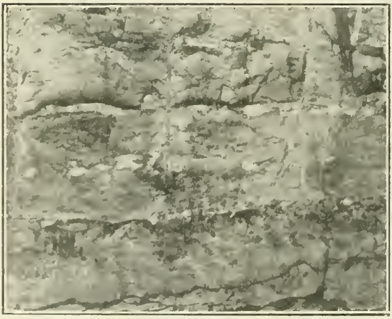

Fig. 3. Limestone with interbedded chert. Newton Co.

souri most of the limestones contain considerable chert or flint (Figure 3), which also remains in the mantle rock.

II.—PHYSIOGRAPHIC PROCESSES.

All land surfaces are subject to **erosion** by which process the land is ultimately broken up and carried to the ocean, a process that in combination with variation in strength and attitude of rock determines most of our topography and drainage and greatly influences our soils. Normal erosion involves (1) **weathering,** by which process the land is distintegrated into such a state that it can be carried away by streams; (2) **corrasion,** by which streams cut their channels; (3) the carrying of the products of weathering, or **transportation** and finally (4) **deposition,** by which process the land waste is deposited en route or finally in the ocean.

Weathering.—This is inconspicuous when observed for a short time but in the long run it results in notable changes. Hills of crystalline rock in the St. Francois Mountains have been reduced to

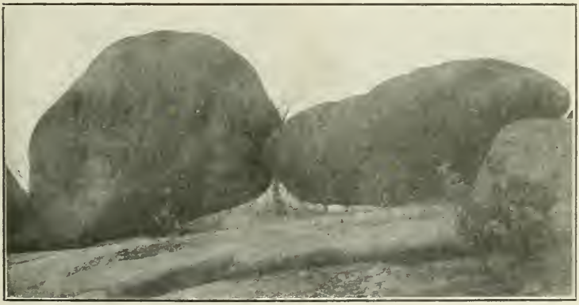

Fig. 4. "Elephant Rocks", Graniteville, Mo. They are residuals left from the weathering of a much larger mass ; "only a fragment of a much larger mass." Mo. Geological Survey, Vol. 8.

boulders, as in case of the "Elephant Rocks," huge to be sure, but only a fragment of the original mass (Figure 4). Solution by ground water in soluble limestones has given numerous caves through the Ozark region. Many of the principles of weathering have been discussed in preceding paragraphs.

Corrasion.—When sand, silt, pebbles, and other products of weathering are taken up by a stream, the various particles abrade each other and they in turn frequently abrade the stream channel. Thus water-carried particles become somewhat rounded or water worn. In most of Missouri, the stream gravels are largely of flint; their edges are rounded but the pebbles are mostly somewhat angular because the flint is so hard and because, for the most part, the gravels have not traveled far. This general process of wear by, and in the stream is termed **corrasion.** A swift stream largely corrades vertically while the corrasion of a sluggish stream is largely lateral. Valleys are deepened largely by corrasion while their sides are reduced by weathering.

Transportation.—By this is meant the carrying of the stream's load; it depends on many factors, including the stream velocity and volume, the amount of load already in the stream, the size, weight, and shape of the load. When any of these factors vary, the transporting power of the stream is affected. For example when a river overflows, its velocity over the overflowed portion is checked, and the stream is unable to carry its load, which is deposited. The Missouri is always muddy because of the fineness of its load. A rapid stream usually carries a coarser load than a sluggish stream. The load of the Missouri has increased since the tillage of the soils in the river's basin has made them more subject to erosion.

Deposition is the converse of transportation. The final destiny of a stream's load is deposition in the ocean although the load may be deposited and taken up many times before the final deposition. The temporary deposition of streams can best be treated in following paragraphs.

Streams and Valleys.—With few exceptions, valleys are largely the work of the streams which flow through them although weathering aids in widening the valley and furnishes much of the stream load. Streams whose corrasion is largely vertical cut comparatively narrow, steep-sided valleys. On the other hand, streams whose corrasion is largely lateral, are widening their valleys.

Streams with wide, flat-floored valleys which are covered at flood, build **flood plains.** These level plains, as the name implies, are built on each side of the river where the relatively sluggish water drops its sediment. Near the streams where the water is first checked the greater part of the stream's load is deposited and here, therefore, is a belt of higher land, the **natural levee**. The flood plain, then, typically includes the higher natural levee and the lower lands toward the limiting bluffs. Owing to the swifter water by which it was deposited, the natural levee is typically sandy and the lower lands are covered by silts and clays which were deposited by the sluggish water. The usual local name for flood plains is "river bottoms". A tributary to a river that is building a flood plain can seldom enter the river directly, owing to the natural levee, but flows parallel until a confluence is found lower down the master stream.

Streams that enter a quiet body of water ordinarily build **deltas.** Except on a very small scale Missouri streams flow into larger streams and the conditions for delta formations are absent. However when a stream flows from a steep to a gentle slope, its velocity is checked and **alluvial fans** or **cones** are built. They are somewhat analagous to deltas but are built on land instead of in water. Typically they are found in the southern half of the state where streams flow down a steep slope into a flat floored valley where they spread out their detritus in a fan or cone shape. Farmers know them by the coarse, cherty soil and often locate homes on them because they are dry, and here shallow wells commonly reach living water.

The work of streams in meanders finds many illustrations in Missouri. The swifter current in a meander is found in the outer and down-stream side. Thus it follows that, in a meander, corrasion occurs on the outer and down-stream side, and deposition on the inner side (Figure 5). Meanders therefore tend to move down stream. There is also a tendency of a stream in a meander to cut across the neck of the meander, thereby shortening the stream course (Figures 47 and 48). The old channel is abandoned and becomes partly filled at flood. When these abandoned channels are crescentic in shape, they are called "oxbow" lakes; when they are of irregular shape they are called "sloughs". Both features are very common in flood plains.

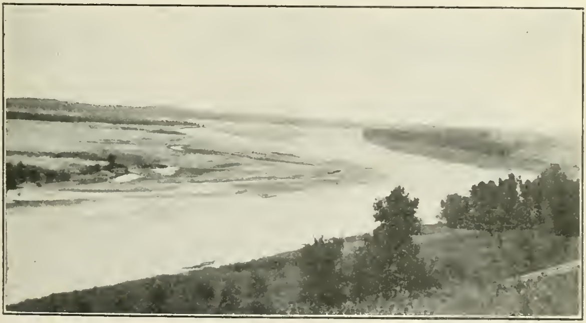

Fig. 5. A meander of the Missouri near Glasgow. On the north (right) side the river is corrading its bank. On the south side it is depositing.

Many rivers of southern Missouri show **incised meanders** of which those of the Osage are among the best examples in the world (Figure 12). In flood plain meanders (Figure 11), the valley does not meander with the stream, but, in the case of incised meanders, both stream and valley meander together. The Meramec meanders are of this class. The projecting spurs are sharpened and finally eroded; near Pacific one of these meanders has cut through its spur, thus shortening the course of the stream. The isolated hill is thus left as the remnant of the once projecting spur.

Glaciation.—(45b: 48)*—Much interest is often shown north of the Missouri in the discovery of boulders and pebbles of quartz, granite, quartzite, greenstones and other rocks entirely different from the local rocks of the state. They are locally called "hardheads" or "lost rocks." In the early days they were widely used for mill stones. The geologist terms them **erratics** because they have been transported from afar. The agent that brought these erratics was a continental glacier that covered much of North America north of the Missouri and Ohio. There are no known outcrops of such rock further south than Minnesota. Some of them came from regions much farther northward.

During the glacial period, continental glaciers of the type now found in Greenland advanced southward from three centers in Canada. Glaciers, like rivers, corrade, transport and deposit material (drift) although not in the same way. A glacier corrades by pushing aside or along the mantle rock, much of which becomes imbedded in the ice. Furthermore, the rocks frozen in the base of the glacier act as tools by which the underlying rock surface is abraded. In a few places in the state the **scratches** made by these imbedded rocks are found when the overlying drift has been removed. The weaker rock such as limestone and shales that was carried on or in the ice was mostly ground up in transit and in consequence glacial drift the world over is largely of clay. Indeed, a common term for the drift is boulder clay. The most resistant rocks survived the journey and were finally left as erratics.

When the ice melted, its load was of course dropped upon the surface underneath and this deposited load constitutes the glacial drift. The drift in Missouri is largely of reddish, well weathered clay, generally with a large amount of flinty fragments. Erratics, except locally, are so rare as to become objects of some curiosity. It is probable that a large percentage of the drift, probably 90 per cent, is local and has originated from the shales and limestones within the state.

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*These numbers refer to items in the Bibliography, page 68.

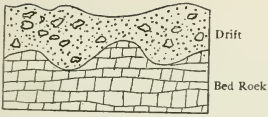

Fig. 6. Diagram to illustrate the concealment of the pre-glacial surface by drift.

The pre-glacial surface and its drainage in Missouri are practically unknown, but coal shafts and wells in various places have revealed what appear to be pre-glacial valleys in many cases not coinciding with the present valleys. The drift commonly masks the old topography except its larger features (Figure 6). It is safe to say that the old surface was much different from our present topography.

The glacial period did not consist of a single advance and recession of the ice, but rather of a series of recurring advances and retreats, each advance leaving its characteristic drift. The first advance in this region left the Kansan drift which covers North Missouri. This advance was followed by a long interglacial period and then four other advances followed, each separated by an interglacial period. The periods in order, beginning at the earliest, are the Kansan, Illinoian, Iowan, Early Wisconsin and Late Wisconsin. Their exposed drifts are shown in Figure 7.

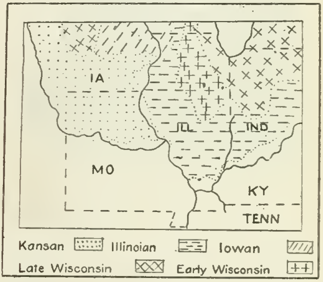

Fig. 7. Map showing the distribution in Missouri and adjacent states of different glacial drifts. after Calvin, Leverett and Todd).

Various features due to ice and the water from melting ice are found in the later drifts, especially the Wisconsin. Moraines or accumulation of drift beneath the ice or at the margin; out-wash plains, made by the water from the melting ice; drumlins, which are ovoid hills of drift, and other surface features are found in the later drifts. None of these forms have been recognized in the Kansan drift. Either they were never formed, or, what is more probable, they were largely removed by the long continued erosion to which the Kansan drift has been subjected. It is probable that intensive study of the Kansan drift will reveal traces of these features, but to ordinary observation the Kansan drift is a mantle of clay and chert fragments with a fairly level surface except where erosion has been active. In Missouri the drift thickens greatly to the north, not infrequently in the northern counties reaching a thickness of 150 feet. Its southern margin is very indistinct and here it is with difficulty that the drift is distinguished from the mantle rock due to ordinary weathering.

The Loess.—This is a fine loamy surface deposit extending principally in belts along the Missouri and Mississippi Rivers, and hence often called "bluff formation". It is usually thickest at the bluffs and thins out at varying distances from them. Its limits are indefinite because the loess becomes thin and also in many places resembles the mantle rock derived from local rock disintegration.

In physical composition loess is intermediate between finest sand and silt. It is usually yellowish except when mixed with humus, when it is dark. Loess is often called clay, but unlike clay, it does not become very plastic when moist. A notable peculiarity of loess is that exposed surfaces remain practically uneroded and stand vertical for years (Figure 8). This is well shown in Kansas City which is built upon this formation.

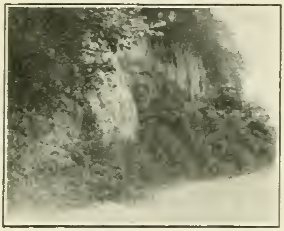

Fig. 8. A road cut in loess, Saline Co. The cut is about 30 feet deep.

There is still discussion as to the origin of loess, but so far as its origin in Missouri is concerned, the loess is probably fine dust derived from river deposits and deposited by wind. The alternative theory is that it is deposited by water, but in Missouri it is hard to explain by this hypothesis its distribution in a narrow zone along the Missouri. Loess covers large areas in Iowa, Illinois, the central Rhine valley, China, and is rather widely distributed over the world. It forms in general an exceedingly fertile soil.

Land Forms and Their Underlying Rocks.—Erosion is the primary factor by which the land is worn away, but the **strength, arrangement** and **attitude** of rock are modifying factors that in part determine the altitudes and shapes of the land forms. If rock be the same throughout, the surface forms will depend entirely upon the activity of erosion. Where erosion is active, the surface will be lower and rougher than where erosion is less efficient. Thus in the thick glacial drift which is practically homogeneous, the hills, valleys, divides, and other topographic features will be due solely to the activity of erosion. A common example of this is that, in the prairie region, the surface becomes more cut up (dissected) near

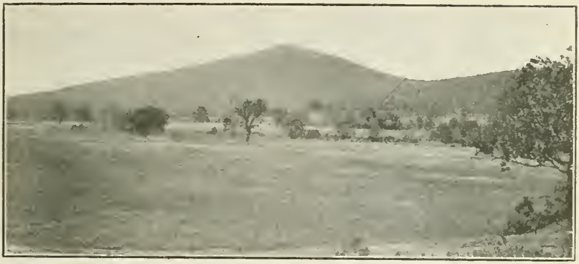

Fig. 9. Pilot Knob, a hill of strong crystalline rock from which the once overlying weaker limestones have been eroded. The valley in the foreground is underlain by limestone. (courtesy of the Mo. Pac. R. R.)

the larger streams, for there the tributaries are more numerous and slopes are steeper.

Where the rocks differ in strength, the stronger formation makes a higher and often a less dissected surface than the weaker. Thus the strong, hard crystalline rocks of the St. Francois Mountains stand above the areas of adjacent weaker rock and are less rugged in outline (Figure 9). If rocks of unequal strength are tilted, the same principle applies, but the shapes of the land forms are different. The underlying weaker rock weathers faster than the overlying stronger rock and the result is a steep slope often forming an **escarpment.** The strata overlying the stronger rock is stripped away, leaving a slope largely determined by the dip of the stronger rock. Typically, then, the net results of erosion in tilted rock of varying strength is a series of escarpments with gentle slopes extending back from them and all these forms somewhat parallel. Figure 10 shows an application of these principles in Missouri.

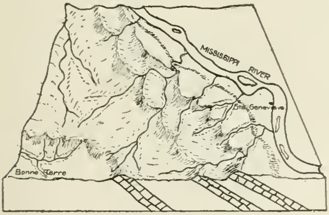

Fig. 10. Diagram to show three escarpments in southeastern Missouri. They are formed by erosion upon a series of tilted rocks. The strong strata are least eroded and make the escarpments. (after Marbut, 45a).

Stages in Land Forms.—The land forms of a given region are not fully described when we know only the strength, structure and attitude of the underlying rocks. If erosion is but beginning its work in a region, the topography will be different from that where erosion has been long and vigorously at work. To illustrate we shall use an example already mentioned in a different connection. The level prairies in North Central Missouri are in many places poorly drained because the streams are not organized for their work. The streams are few, their tributaries are not well developed, they flow in shallow, narrow, steep-sided valleys of low slopes. The divides are wide, flat, and not distinct, and in consequence of the gentle slopes, the run off of rainfall is poor. Erosion has but begun its work of reducing the land to sea level.

If we follow the streams to an important master stream, we find the topography and the stream habits are changing. The increased slope and volume of the streams give them greater efficiency As a result, the tributaries become numerous, the divides narrower and more distinct, the valleys are deeper and wider. In other words, we pass from the prairies to the "rough country," from erosion at its early inefficient stage to its more efficient stage. For the sake of conciseness we say that the prairie is in the **youthful stage** and the rough country is in an early **mature stage.**

In maturity streams are at their maximum vigor, the region is thoroughly drained and the topography relatively rugged. Later the valleys widen and the main streams develop such gentle slopes that the streams begin to erode laterally.

After long continued erosion, the stage of **age** appears. In this stage the divides are worn to gentle rounding outlines, the valleys are relatively shallow, the streams have low gradients and the topography becomes "rolling" instead of rugged. The landscape regains something of the appearance of youth, but the developed stream organization secures good drainage.

It should be remembered that the time during which a region passes through the stages of the cycle or erosion varies with many factors, chief of which are the vigor of erosion and the strength of the rocks. The interesting Osage valley furnishes a fine example. (Figures 11 and 12). In the upper valley in the weaker rock the slopes are gentle, the valley is wide, the divides broad and rolling, and the stream is relatively sluggish. The lower valley shows contrasts in all these features. In both cases the stream meanders but, in the upper valley, the meanders are of the flood plain type while, in the lower valley, they are incised. The upper valley in the weak rocks has reached the stage of late maturity or age while during the same period, the lower valley in the stronger rocks has only reached middle maturity. Thus the upper valley, while younger in age, is older in stage.

To understand and appreciate the physiography of Missouri, one must have in mind these three basal factors, **process, structure,** and

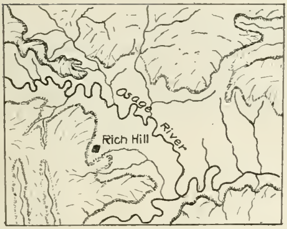

Figure 11

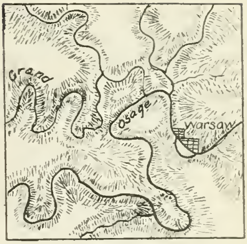

Figure 12.

Fig. 11 shows the wide upper Osage valley in *weak* rock. In Figure 12 is shown the narrow lower Osage valley in *strong* rock.

stage, which will be used in the following chapter to describe the various provinces of the state.

III.—PHYSIOGRAPHIC PROVINCES OF MISSOURI.

The foregoing principles all have notable application in Missouri. It is first to be noted that Missouri is not sharply distinct physio-

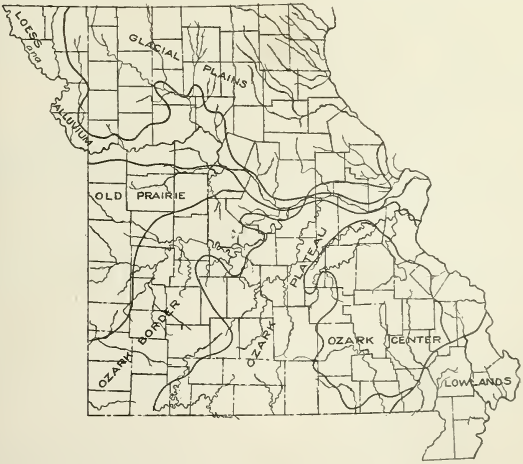

Fig. 13. Physiographic Provinces of Missouri. (after Marbut).

graphically from the bordering states and that the various topographic divisions or as frequently called, physiographic provinces, are not confined to this state but are shared with neighboring states.

Four areas, markedly distinct in topography and usually distinct in geology and soils, are to be found in Missouri: The Ozarks, the Prairies, the Mississippi Lowland, and the Mississippi-Missouri valleys. (Figure 13).

THE OZARKS.

We have noted in preceding paragraphs that the rocks of Missouri dip gently away in all directions from the St. Francois Mountains and that the younger overlying rocks once covering the crystalline rocks of the St. Francois Mountains, have been eroded, leaving the old rocks exposed along parts of this center of uplift where the up-folding was most pronounced. The rugged country about this center of uplift is everywhere known as the Ozarks, but the division between the Ozark's and the Prairies is both geological and physiographic. The outer rim of the Ozarks in Missouri is defined by the Mississippian (Figure 2), although in Arkansas the Ozarks also include the dissected country underlain by the Pennsylvanian. The Ozarks in general are more dissected than the prairies and in general are higher although it must be remembered that there are large areas of level country in the Ozark region and, moreover, considerable areas of dissected country in the Prairies.

The Ozarks as a whole may be conveniently divided into four regions: the Ozark Center, the Ozark Plateau, the Ozark Border, and the Boston Mountains, the latter being in northern Arkansas. The distribution of these provinces is shown in Figure 13. The boundaries between the provinces as shown in the map are generalized. Indeed the exact boundary between the divisions can seldom be located by one on the ground. If exactly drawn, the boundaries would be much more irregular than shown in the generalized map.

The Ozark Center is not the geographic, but rather the geological center, of the region. Here are the oldest rocks surrounded by semi-concentric belts of younger rocks. The distinction between these and surrounding areas is also topographic. Here is the most dissected area in the Ozarks. There are practically no level areas except very narrow flood plains along some streams. It is a maturely dissected region.

The Center is composed of a core of very old crystalline rocks, mainly granites and porphyries and a surrounding belt of sedimentary rocks, mostly limestones. The hills on the crystalline rocks are

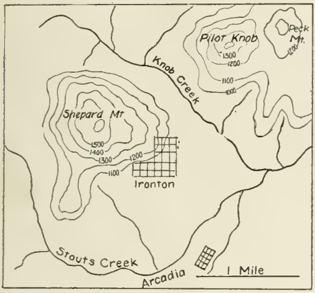

Fig. 14. Map of a portion of the St. Francois Mountains.

rounded and somewhat dome-shaped (Figure 14). They are not the result of recent erosion but were eroded in pre-Cambrian time, then covered by sediments which hardened into rock, and have again been exposed during the present cycle. The old pre-Cambrian surface is most thoroughly exposed in the St. Francois Mountains from which the overlying limestone has in some cases been entirely stripped and in other instances, for example in the Arcadia Valley, a small area of limestone still lingers in the valleys (Figure 15). As far west as Shannon County, these old hills have been uncovered either singly or in groups and, so to speak, stand as islands in an ocean of limestone.

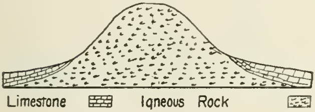

Fig. 15. Section from Arcadia, northwestward across Shepherd Mountain. See Figure 14. (Vertical scale greatly exaggerated).

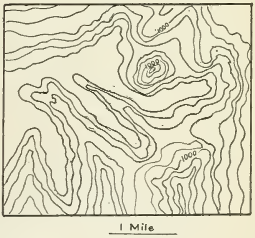

Fig. 16. An area in the limestone region of the Ozark Center. Contour interval 100 feet. DeSoto Quadrangle, U. S. Geological Survey.

The hills in the sedimentary rocks of this province are due to the erosion of the present cycle. The surface of the original plain has been so thoroughly cut up that the topography is mainly one of steep slopes, of long narrow irregular ridges between steep sided valleys. Figure 16 shows an area rather typical of the limestone Ozark Center.

The Ozark Plateau occupies the west central part of the Ozark region in Missouri. It is a dissected plateau and a considerable portion of the old plain surface still remains on the relatively flat divides. The underlying rock as elsewhere in the Ozarks in Missouri is mainly limestone. The southern part of the plateau is rougher than the northern part.

The Ozark Border surrounds the outer provinces in a nearly complete circle. It is an irregular zone developed in gently tilted strata of limestone. This zone is transitional between the dissected Ozarks and the smooth prairies. Its topographic features are easily explained in light of the preceding discussion of tilted rocks. In general, the rock underlying the Mississippi limestones which form this province is relatively weak. Here, then, we have conditions which favor the development of a steep slope facing the Ozark Plateau and a gentle slope extending toward the Prairie Plains. The diagram, Figure 17, illustrates these features. The upturned edges of the Mississippian limestones are eroded less rapidly than the underlying limestone. This escarpment, termed by Marbut the Burlington escarpment from the overlying Burlington limestone, is a persistent feature in Southwestern Missouri. It extends for miles, not as a clear cut slope but as a dissected range of hills. West of this escarpment is a plain, termed by Marbut the Springfield Plain,

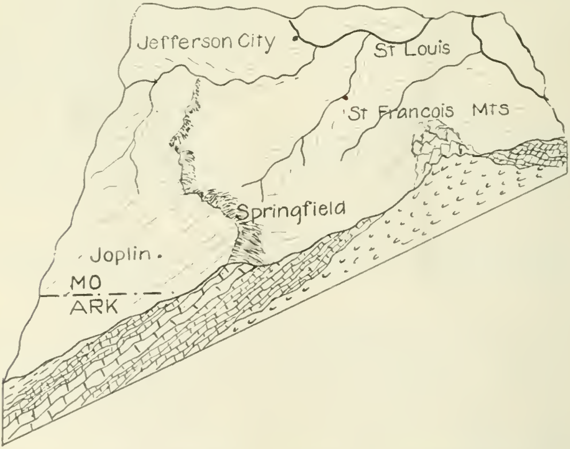

Fig. 17 . Diagram showing the relations of the Springfield Plain, Burlington Escarpment and St. Francois Mountains to the underlying rocks.

which is a part of the Ozark Border. (45a). In general the Border is relatively smooth as compared with the rest of the Ozark region and slopes gently away from the Center. Indeed the border in Southwestern Missouri is frequently called the "Southwestern Prairies".

Evolution of Ozark Topography.—While a wide view over almost any portion of the Ozarks in Missouri shows a rough surface, yet it is seen that the higher hills reach something of the same altitude. Moreover a considerable number of relatively smooth high areas are found. A notable example is the broad flat ridge along the Frisco Railroad from Pacific to Springfield. The railroad runs for miles on a surface where there is no more cut and fill than in the prairies. These and other facts point to a time when the Ozarks in Missouri, at least, were worn to a fairly level plain. Long continued erosion after the doming of the Ozark region reduced the area to a fairly level, low plain. The entire region was then elevated with the result that the streams acquired new energy and the present topography is due to erosion on this old plain. The Ozark region in Missouri is therefore an old plain which is maturely dissected.

Expressing these facts concisely, the Ozark area was nearly peneplained, a re-elevation interrupted the first cycle and started another cycle in which we now find the topography. As before stated, several remnants of the old plain still stand unreduced. They are usually called prairies and are especially numerous near the border. The narrow, long, unreduced area between Pacific and Springfield

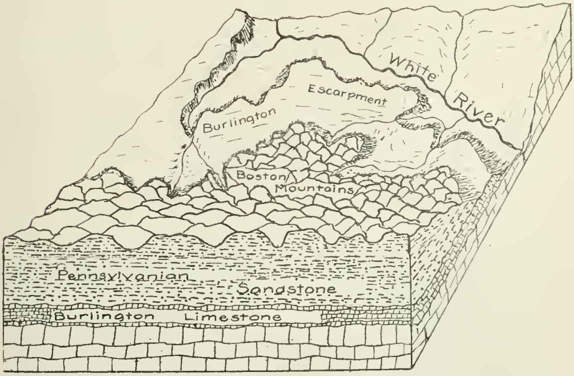

Fig. 18. Diagram showing the Boston Mountains and the Burlington Escarpment, and their relations to the underlying rocks.

occurs because it is the divide between the Missouri and Mississippi drainage. The stream head waters have not yet reached the flat divide and dissected it. Generally speaking, the dissection is greatest at the geological center and decreases outward, although there are many exceptions to this statement.

The Boston Mountains (41; 23) are in Arkansas south of the Ozark border. In structure they are a counterpart of the Burlington Escarpment. They are underlain by Pennsylvanian shales and sandstones, under which are the limestones of the Mississippian; all of the rocks dip southward. Hence the Boston Mountains are a dissected plateau much rougher and less fertile than the adjacent Ozark Border and Plateau to which it descends by a well defined, irregular escarpment in places several hundred feet in height (Figure 18).

THE PRAIRIE PLAINS.

The Prairie Plains are distinguished from the Ozarks by their topography and geology. As the surface of the Ozarks is largely the result of the underlying rock, so the main features of the prairies are largely due to their underlying formations. While the prairie plains are generally level or rolling, yet portions are quite as much dissected as any area in the Ozarks. The rocks underlying the prairies are coal measures or Pennsylvanian, and are largely shales and limestones. Like the rocks of the Ozark region, they dip away from the Ozark Center but at a very low angle. From such a structure is derived the succession of plains and escarpments as is found for example in the Burlington Escarpment and the Springfield Plain, but these features are not generally so pronounced as in the Ozark region.

South of the Missouri River the Prairie Plains are rolling. Wide,

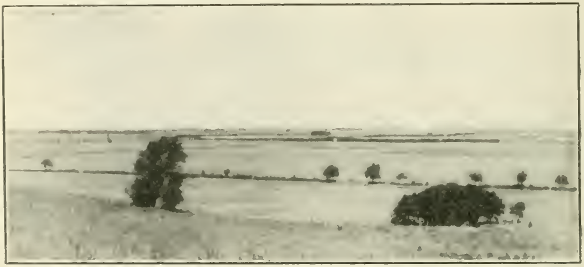

Fig. 19. "Wide valleys and rounded divides" in the Old Prairie, Barton Co.

gentle sloped valleys, streams with gentle grades and broad flood plains, and broad, rounded divides are characteristic (Figue 19). The streams are well organized and numerous branching tributaries aid in the drainage. The Prairie Plains north of the Missouri are level except for the relatively narrow and steep sided valleys (Figure 20). The divides are flat rather than rounded and the streams have not extended their tributaries to drain the entire surface of the flat divides, although many of the larger streams are graded. In short, the southwestern prairie plains are mature in stage, while the northern plains are youthful or early mature. The prevalent shales of this division south of the Missouri have worn more rapidly than the limestones of the Ozarks and hence are in a later stage, although the same age. The same stage was undoubtedly reached in the northern plains, but these were covered by glacial drift which has partly masked the smaller topographic details and superimposed on the old surface a topography that is relatively young. Along the boundary between the upper and the lower coal measures on an irregular line from Cass County to Mercer County, there is a well marked escarpment.

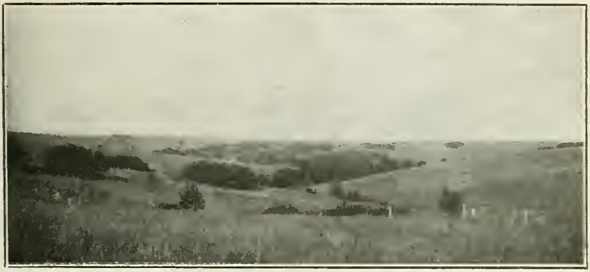

Fig. 20. Rolling Glacial Prairie. Sullivan Co.

It should be remembered that these descriptions are general and considerable areas in each are exceptional. Along all the larger streams there is a belt of dissected country even in the southwestern plains. These prairies extend northward and westward and form a part of the plains of the Mississippi Basin.

It will be evident that there are two great types of prairies, the old and the new, or the prairies developed by long erosion on the relatively weak coal measures of the southwest and the prairies on the recent covering of glacial till over the northern half of the state. In contrast with the Glacial or New Prairies the prairies of southwestern Missouri can be termed the Old Prairies. The New Prairies are largely constructional in origin; the Old Prairies, largely destructional. The Old Prairies have the smoothness of long continued erosion; the New Prairies that of but brief erosion.

THE MISSISSIPPI LOWLAND.

This lowland is usually known in the state as the Southeastern Lowland. It begins near Cape Girardeau and extends southward through Arkansas to Mississippi and Louisiana and forms what is called the Mississippi Lowlands. The discussion will be confined to the part in this state and is entirely a condensation of Professor Marbut's excellent monograph of the region (46).

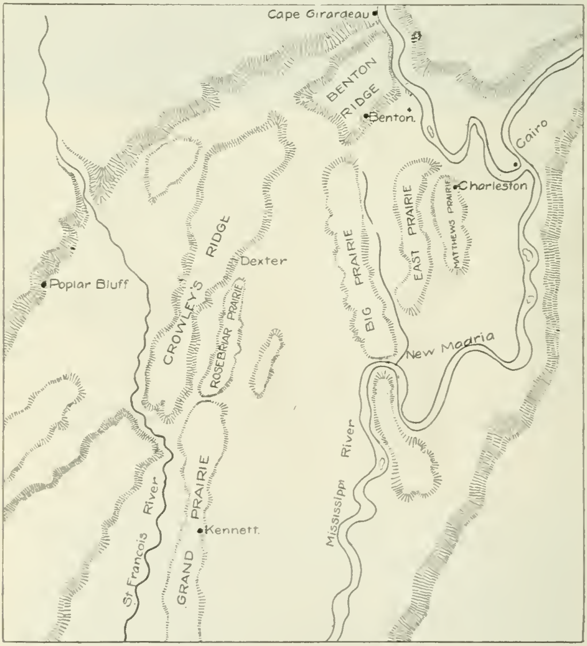

Fig. 21. Map of the Mississippi Lowlands in Missouri.

The southeastern lowlands, as its plural name implies, is not a single physiographic division, but rather three lowlands separated by two well defined ridges, one of which, Crowley's Ridge, is sharply defined. The main features are brought out in the map, Figure 21.

From Cape Girardeau southwestward past Poplar Bluff is a well defined bluff, in places 200 feet high. Southeast of this bluff is a lowland which is limited by Crowley's Ridge. This ridge, although not high, is a prominent feature because of its relative height above the level lowlands. Near Delta it is broken by a wide gap and is continued northward by a ridge known locally as Commerce Hills or Benton Ridge. East of Crowley's Ridge is a wide level, lowland which is interrupted at Sikeston by a low, inconspicuous ridge extending southward past New Madrid. Beyond this ridge is a lowland extending across the Mississippi into Kentucky and Tennessee.

The broad eastern lowland, the prominent Crowley's Ridge and the narrow western lowland have long excited inquiry as to their origin. As early as 1818 the traveler Darby, looking from Poplar Bluff, observed that the western lowland "must have been an old course of the Mississippi" (9a).

The development of this region illustrates on a large scale the process of stream capture by which one stream may send out a tributary and annex another stream. Formerly the Mississippi River turned southwestward at Cape Girardeau and flowed along the western lowland past Poplar Bluff. The Ohio flowed somewhat west of its present course, the two river courses being approximately parallel. Under such conditions, one stream is very likely to lower its channel faster than the other. The tributaries of the stronger stream have an advantage and they will ordinarily extend back and divert the weaker stream into the stronger. In this instance the Ohio was the stronger. In Figure 24 the early approximate position of the two rivers is shown. Both had reached grade and had opened wide valleys, that of the Ohio being much the wider. Crowley's

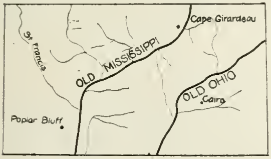

Fig. 22. First relative positions of the Old Ohio and the Old Mississippi. (after Marbut. 46).

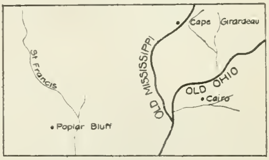

Fig. 23. The courses of the Ohio and the Mississippi after the first capture. (after Marbut. 46).

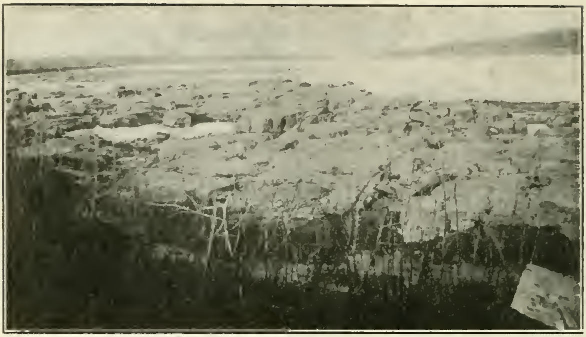

Fig. 24. The Gorge of the Mississippi. Benton Co. (after Marbut).

Ridge then extended a considerable distance farther east than at present. Finally a tributary from the Ohio extended northwestward through Crowley's Ridge, captured the Mississippi near Delta and diverted the river into the Ohio (Figure 23). The Mississippi followed this course and opened a valley nearly ten miles wide, this valley now separating Crowley's Ridge and Benton Ridge. Again the masterful Ohio reached northward by a tributary and captured the Mississippi near Commerce, and this new valley is the one now followed by the Mississippi (Figure 24). This valley has a width of only about a tenth that of the valley due to the first capture, and its narrowness shows how much more recently it was made.

Summarizing, Crowley's Ridge, formerly wider than at present, lay between the Ohio and the Mississippi. Both rivers had passed from youthful to mature habits and had opened wide valleys. The Ohio, being somewhat lower and carrying a load less heavy than that of the Mississippi, possessed an advantage over the latter. Twice the Ohio tributaries reached backward and captured the Mississippi; once at the gap near Delta and later at the present gorge at Commerce.

THE RIVER LOWLANDS.

Flood plains fringe not only the Mississippi and the Missouri, but many of their more important tributaries. Their total area constitutes a not inconsiderable portion of the state. The general features of these alluvial lowlands are simple and have been discussed before. Their streams are practically all graded. They meander freely in their flood plains, at places touching the enclosing bluffs. The natural levee with its sandy soil is found along the stream and lower land or swamps are found back towards the bluffs. Fragments of natural levee, cut off lakes and sloughs mark old and deserted channels of the rivers. The Missouri flood plain between Kansas City and St. Louis has an average width of less than three miles for the eastern half. The western half, which is in the weaker coal measures, is nearly three times as wide on the average. It is also wide above Kansas City. The Mississippi flood plain has an average width along the state of about five miles, but near Cape Girardeau it narrows to about a mile. Below Commerce the flood plain widens and becomes merged in the Southeast Lowland. Along the state line, more of the flood plain is in Illinois than in Missouri. The Grand and Chariton have flood plains five or more miles wide and many other streams, especially in the prairies, have wide flood plains.

IV.—SOILS OF MISSOURI. (73, 74)

A description of the known facts about the soils of Missouri would fill several volumes and only a beginning of soil investigation has been made. Here perhaps more than in any other subject the average person, whether a farmer or not, can do first-hand research work. The soil composition, structure, texture, and moisture can be easily observed while all about are the crop laboratories where the responses of crops to various soil types and methods of cultivation are easily observable and are profitable for study from an economic standpoint. For school work, the study of soils is an unfailing source of interesting materials.

Soils from a physical point of view may be considered under three heads, their texture, the topography of the region, and their origin. Texture ranges from heavy clays and silts through the medium loams to the light sands. Loams are mixtures of clay or silt with sand. If the sand and other constituents are about equal, it is a loam; if the clay predominates, we have a clay loam, or if the sand predominates, it is a sandy loam. A full description of the different types may be found in almost any book on soils.

The topography is of vital importance in soil drainage, itself a most important factor. If there is the good stream development of early maturity or age, there is good drainage, as in portions of the glacial prairie near the principal streams. Where the region is in youth, the surface flat, the stream organization poorly developed as in portions of the glacial prairies and lowlands, the drainage is poor. Again in regions of mid maturity, drainage is too good for the soils. In the loess belt the balance between rainfall and run off is such that a plentiful humus has been produced and these soils are extremely fertile. The relation between stage and soils is easily observed and is an interesting local study.

As to origin, soils may be derived from the underlying rock (residual) or be carried into the region (transported). Residual soils, of course, vary with the kind of rock from which they are derived. Limestone in general yields clays, silts, and heavy loams which are the prevailing soils of Missouri. Shales yield soils varying with the composition of the parent rock, and ranging from heavy to sandy loams. Sandstones yield sands and sandy loams. Very interesting variations in soils derived from different rocks arranged in narrow belts are found in the Ozarks of which a fine example is described in the Soil Report of Cape Girardeau County (74).

The most important transported soils are those carried by water (alluvial), by ice (glacial) and by wind (aeolian). The alluvial soils of the flood plains are prominent in Missouri since nearly every important stream is flanked by these "bottom soils." Typically the higher natural levee is of sands and sandy loams, while the lower back lands have clays, silts, and heavy loams. Corn grows well upon the higher loams and wheat upon the heavier soils, so that one may often stand on the bluff overlooking a broad flood plain and see the different soil types mapped by appropriate crops on the flood plain beneath. However, owing to the meandering haits of most of our larger streams, the alluvial soils are of an arrangement far from simple. Figure 25, which shows a small area of alluvial soils, will indicate their "patchy" arrangement.

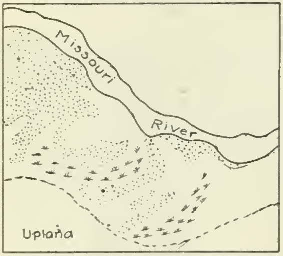

Fig. 25. Flood plain soils along the Missouri. The dotted areas represent sands and sandy loams; the other areas are silts and clays. Saline Co. (U. S. Soil Survey.)

The glacial soils cover approximately one half of the state. They are derived from weathered drift which is largely composed of clay. The glaciers in reaching Missouri passed over large areas of limestone and in consequence the till is largely composed of limestone products and of their disintegration. The soils are largely clays and loams. Their texture is rather uniform and drainage and topography are especially important factors. The glacial soils in this part of the Mississippi Basin rank high in fertility.

Although of not great area in the state, the loess is a very productive soil, these soils being perhaps the most productive in the world. Under another paragraph it was noted that there is still some discussion as to the origin of loess, but in Missouri it is generally considered as wind blown, or eolian. It is usually a silty loam with its soil dark from included humus and its subsoil yellow in color. The glacial soils, as has been before noted, vary considerably with the topography, since the till from which they are derived is remarkably uniform. The rolling prairie has good drainage and is productive. The level prairie has comparatively poor drainage, but when drained, is fertile. The Black Prairies are portions of the Glacial Prairies which have a somewhat slow drainage and a high percent of humus, or partly decayed vegetable matter. They are a part of the famous black soil area of the Middle West.

The soils of the Old Prairie are clays, silts, and heavy loams for the most part. These heavy soils need adequate drainage which is provided by the mature drainage and excellent run off of the region. In general, these soils are productive far above the general average of the United States.

Alluvial soils, other things being equal, are among the most

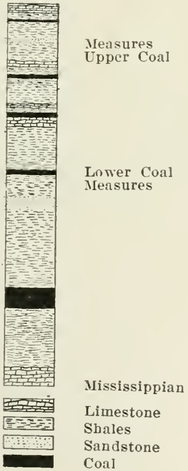

Fig. 26. Section of upper and lower coal measures in Macon Co. The total thickness is about 180 feet. (after Gordon, Mo. Geological Survey).

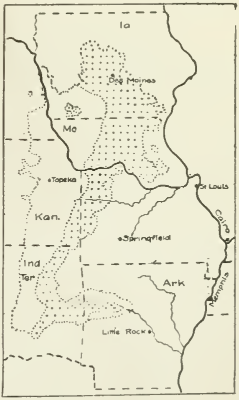

Fig. 27. The Western Coal Field. The dotted area indicates proved workable coal; the enclosed area, possible workable coal. (U. S. Geological Survey 41).

productive. But in most cases, they require somewhat expensive artificial drainage. The state law provides for drainage districts and they have been organized to a slight extent along the Missouri and the Mississippi and to a considerable extent in the lowlands. The soils of the alluvial belt show all variations from heavy clays to sands.

The Ozark soils (73) as would be expected show a great variety. As we have seen, there are many outcrops of different rocks due to the gentle up-folding of the region. Again there is every gradation in dissection from the prairie-like areas of much of the western border to the minutely dissected areas of the center. These various stages of dissection with their varying degrees of drainage and erosion would yield a variety of soils quite independent of the variable underlying rocks. Most of the Ozark rocks are limestone often containing considerable chert. The resulting soils are largely clays, silts, and heavy loams, which are much modified by various degrees of erosion to which they have been subjected. Compared with the other types of soils in Missouri, the Ozark soils as a whole are relatively infertile, although in more densely settled states, a high percentage would be classified as productive. The methods of extensive agriculture that prevail on the prairies must be modified for the Ozark soils.

V.—MINERAL DEPOSITS OF MISSOURI.

Coal.—(33, 41). We have briefly referred to coal bearing rocks of the Pennsylvanian period whose distribution is shown in Figure 2. The origin of these coal beds is explained in all text-books and need be treated here only in outline. First, there were extensive swampy areas in which vegetable matter accumulated and was partially preserved from decay. At times these swamps were submerged beneath the sea and the sand and mud deposited over the accumulated peat beds, and ultimately hardened to sandstones and shales. The accumulations and oscillations recurred many times, resulting in alternating beds of rocks and coal, the coal always forming but a small fraction of the total thickness of the coal measures or rocks in which coal is commonly found. The arrangement is well shown in the section (Figure 26) in one of the best fields in the state where but a small per cent of the total thickness of coal measures is coal, and not all the coal is workable because of the thinness of the seams. The coal of Missouri is bituminous and the coal field is part of the western field, one of the largest fields in North America, covering portions of several states (Figure 27). Much of the coal is undeveloped.

Iron.—The early exploitation of lead in Missouri led to the discovery and ultilization of the iron ores in the lead district About

1816 a furnace near Ironton smelted ores taken from Shepherd Mountain. In the thirties the rich ores of Iron Mountain and Pilot Knob were utilized. The production was increased by the building of the Iron Mountain Railroad, which was extended to this region in 1858 when an outlet was provided for the ore. The production increased, reaching its maximum in 1887, after which it declined, owing to the exhaustion of the rich bodies of ore. In Crawford County ore was mined and smelted in the twenties. The map (Figure 28) shows considerable ore in the state, but at present it is largely unworked because of the rich accessible ores in the Minnesota, Wisconsin and Alabama fields.

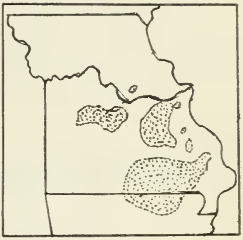
Fig. 28. Principal iron ore regions in Missouri, 1909. (U. S. Geological Survey).

Glass Sand.—The Cambro-Silurian have several beds of thick white sandstone that is mostly unconsolidated. In the early thirties these beds were explored and their usefulness for the manufacture of glass was appreciated. Glass sand from the beds below St. Louis was early an important product, some of it being shipped as far east as Pittsburg. Cheap coal and sand, together with a good market, have been factors in concentrating an important center of glass manufacture at Crystal City, St. Louis, and that vicinity.

Lead and Zinc (37, 38, 39, 40, 41, 42) occur in many counties of the state, but the prominent areas that are now productive are in three districts, the southeastern, central and southwestern (Figure 29). Zinc and lead may be described together, since they are often associated minerals; they occur together in the central and in the southwestern districts.

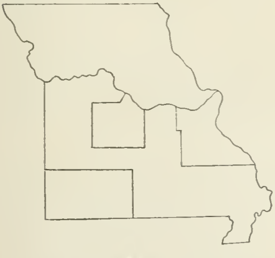
Fig. 29. Map showing the main lead and zinc districts in Missouri. (after Winslow).

The principal ore of lead in Missouri is galena, a mineral composed of lead and sulphur. It is a heavy, dark colored mineral, locally called "blue mineral." The principal ore of zinc is sphalerite, composed of zinc and sulphur. Local names are "Jack," "black jack," "rosin jack" and "blende." Zinc carbonate and zinc silicate are also found. The ores are always associated with rock and other minerals, called "gangue," from which they must be separated. The ores may be scattered in small particles through the rock (disseminated) or in irregular bodies (Figures 30 and 31). Again they may be in small, irregular masses in the mantle rock. This latter form was the one usually mined in the early days, since it was most accessible. Geologists agree that lead and zinc ores were deposited by water percolating through the rocks, but why the ground water concentrated the deposits in certain districts is still undecided.

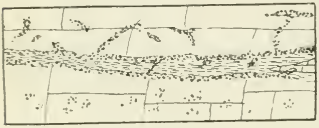

Fig. 30. Lead ore in limestone. St. Francois Co. (after Buckley).

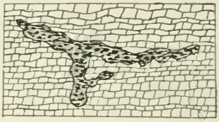

Fig. 31. An irregular zinc ore body in limestone. Lawrence Co. (after Winslow.)

VI.—CLIMATE OF MISSOURI.

Like the physiographic provinces of the state, the climate of Missouri is not peculiar to this state, but rather is shared with the surrounding states of the Central Mississippi Basin. For our purposes the climate of Missouri can be described under four heads: sunshine, temperature, precipitation and winds. Climate is distinguished from weather in that it is the average condition of the weather. Weather is the condition for a shorter period. Thus we speak of the climate of Missouri, but the spring weather or the weather for a day or a week.

Sunshine as generally used means the time during which the sun is shining. It depends mainly on two factors: the length of day and the degree of cloudiness. In this respect Missouri's sunshine reaches about 60 per cent of possible sunshine, which is 10 per cent above the average for the United States.

Temperature is the resultant of several factors. The primary factor is the heat from the sun (**insolation**) which varies with the inclination of the sun's rays and with the length of day. **Winds** transport warm or cool air from one region to another. Temperature on the average the world over decreases with **altitude** at an average rate of one degree for every 300 feet, a rate, however, subject to great local variations. **Radiation** of heat already absorbed varies with several factors, including the state of the sky, clear or cloudy, wind movement and the nature of the soil. **Slopes** are locally very important.

Temperature records should show many facts aside from the mean annual temperature that is usually given. For example, the mean annual temperature of Missouri is 54 degrees. This does not indicate its seasonal, monthly or daily distribution, and crops must be handled with respect to the seasonal temperature and to maximum and minimum temperatures. In other words, the average hot and cold periods should also be given.

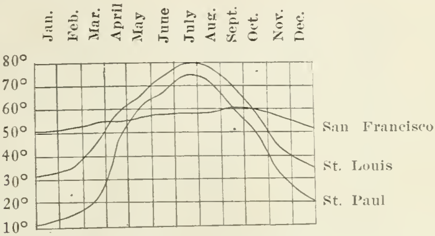

Fig. 32. Annual temperature graphs of St. Louis and St. Paul (continental) and San Francisco (marine).

The yearly temperature type of Missouri, like that of all the interior states, is continental as compared to portions of the Pacific States, which is marine. The graphs in Figure 32 of St. Louis and St. Paul and of San Francisco bring out the contrasts of the two types. The continental climate has great extremes of summer and winter and the same contrasts appear in the daily temperatures (Figure 33).

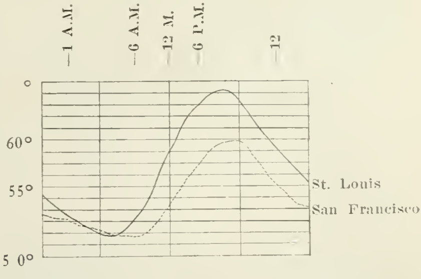

Fig. 33. Graphs of daily temperatures, St. Louis and San Francisco.

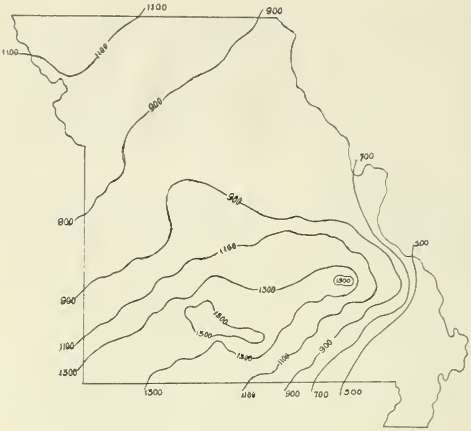

Fig. 34. Contour map of Missouri. Contour interval, 200 feet. (after Marbut, 45a).

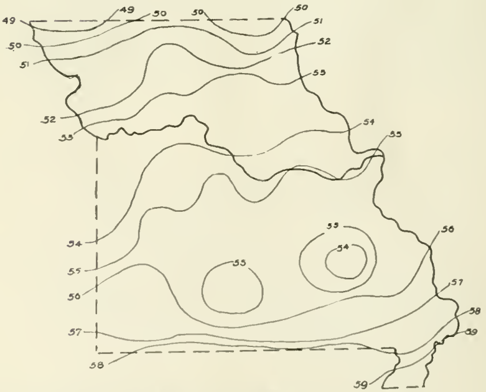

Fig. 35. Annual temperature map of Missouri from averages of 21 years. (after George Reeder, U. S. Weather Bureau).

There are no great extremes of elevations in Missouri as a whole. The higher Ozarks show a somewhat cooler temperature, but the tendency is checked by their more southerly position. The isotherms (Figure 35) show a difference in annual temperatures of about ten degrees between the northern and the southern parts of the state. The higher altitude and more northerly latitude account for the more rapid change to the northwest. Two cool areas in the Ozarks are due to local elevation, the St. Francois Mountains and the high plateau east of Springfield (Figure 34). The hottest area is in the southeast lowland, its temperature being due to its southerly latitude and its low altitude. From the annual isotherms Missouri is seen to have the same average temperature as most states to the eastward in the same latitude, except the Allegheny Plateau in West Virginia. So far as annual temperature is concerned it has the same as much of the Pacific Coast, but the Coast has a more even temperature, due to the oceanic influence. Missouri belongs to that large group of states having a hot summer and a cold winter.

Winds.—All the United States except Southern California and possibly Southern Florida lie in a system of winds whose general direction is westerly and southwesterly; in other words, the zone of the westerlies. South of us is the zone of trade winds which during the summer reach Florida and California.

Cyclones and Anticyclones.—Without careful observation it is not

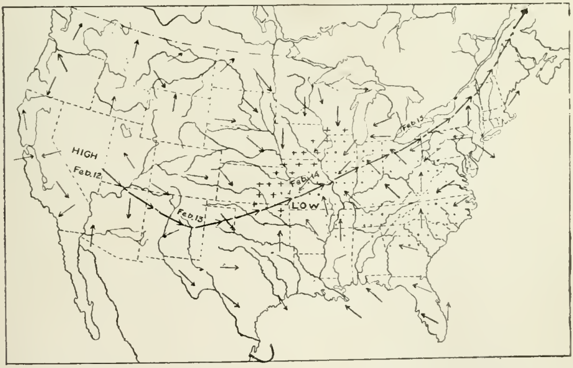

Fig. 36. Cyclone and anticyclone, Feb. 14, 1908. The heavy arrows show the path of the cyclone, Feb. 12-16, the lighter arrows, the wind directions; the dates show the successive positions of the cyclone's center. The dotted areas were rainy and cloudy; the areas indicated by crosses were regions where snow was falling on Feb. 14.

at once evident that most of our winds are westerly, since they blow from all possible directions. The reason for this variability in wind direction is to be found in the cyclones and anticyclones which are peculiar to this belt of westerly winds.

The term cyclone, properly used, means a rotating system of winds moving from west to east with the prevailing drift (Figure 36). For the violent local whirling storms to which the term is often applied, the term **tornado** is the better. When there is a large area of light air, the surrounding heavier air flows toward it from all direction and forces up the lighter air in the center. If the earth were not rotating, these winds would in a large measure blow straight into the low pressure area and force the lighter air up. The earth's rotation deflects southerly winds to the east and northerly winds to the west. In consequence, the winds enter the low spirally instead of straight (Figure 36).

Anticyclones have heavy air at the center which blows out in all directions toward the higher air. Here again the rotation of the earth deflects the northerly winds eastward and the southerly winds westward (Figure 36). The air movement in an anticyclone is with the hands of the clock or clockwise, while the rotation in the cyclone is counter-clockwise.

Cyclones and anticyclones are usually associated, a cyclone seldom appearing without an adjacent anticyclone. Both are hundreds of miles in diameter, a cyclone or an anticyclone not infrequently occupying all of the United States east of the Rocky Mountains.

Precipitation in the forms of rain, snow, dew and frost is always due to the cooling of air below its dew point. The air even in the droughts of our summer is well supplied with water vapor, but there is no precipitation because the vapor-bearing air does not become sufficiently cooled. Air is cooled to the point of precipitation in several ways. Most important of all is the cooling by rising. When air rises, as for example in the center of a cyclone or in passing over a mountain range, it cools in two ways: in rising the air expands and is thereby cooled, and, furthermore, it comes into contact with cooler air and is somewhat chilled. This is the origin of most of our important rains. Again a mixture of warm and cool air will often chill the former to its dew point and cause precipitation. Locally, warm, moist air passing over cool surfaces is frequently so chilled that fogs result, such as we see in spring over a river.

Our summer thunder storms illustrate these principles. They usually occur when there are no strong cyclones or anticyclones. In the afternoon the air becomes heated, rises and is chilled to its dew point and the storm slowly drifts eastward with the westerly drift, giving the familiar phenomenon of our summer rains coming from the

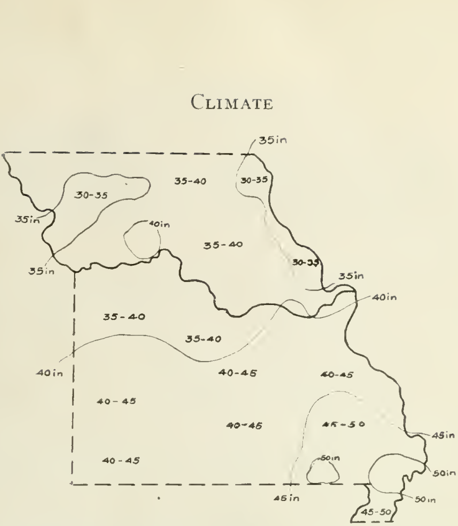

Fig. 37. Mean annual rainfall of Missouri from averages of 21 years. (after George Reeder, U. S. Weather Bureau).

west. Other thunder storms are connected with the movement of cyclones.

The average annual rainfall of Missouri as a whole is 39 inches (Figure 37). The state lies well within the humid belt of the United States. But the average rainfall, like the average temperature of a place, gives but little idea of the important factor of distribution. Some parts of California with an average annual rainfall of over 20 inches are so dry during the crop season that irrigation is necessary. For most of the United States the critical crop months are from March to August, the growing season. For most crops, a dry harvesting season is desirable. Missouri as well as most of the Plains states west of the Mississippi and east of the ninety-eighth meridian has a very favorable distribution of rainfall. The graphs in Figure 38 bring out this fact by comparing the distribution with that of the Eastern and the Pacific states.

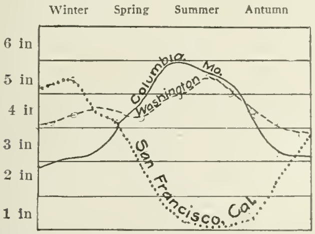

Fig. 38. Graphs showing the yearly distribution of precipitation at Columbia, Mo., Washington, D. C., and San Francisco, Cal.

The weather of most of the United States is intimately connected with cyclones. Were it not for cyclones and anti-cyclones, one day's weather would be much like that of another, a condition that obtains in belts of relatively constant winds as the trade wind belt. These movements during the fall, winter and spring months progress at an average rate of about 30 miles an hour and average, perhaps, two or three each week.

Each cyclone and its usually following anticyclone is a weather unit by itself. The temperature, precipitation, winds and cloudiness are in marked contrast in front of and behind the whirls. East of a cyclone the winds are easterly, the temperature relatively warm and the sky usually cloudy. West, the winds are westerly, the sky usually clear or clearing as the anticyclone follows.

In the cyclonic control the preceding principles find application. In front of a cyclone the warm southerly winds are cooling and therefore likely to yield clouds and rain or snow, especially when they rise in the center of the cyclone. These winds are, for the most part, warm, because they blow from southerly latitudes, and because the prevalent cloudiness retards radiation. Back of a cyclone the winds are cooler because they are westerly and northwesterly. They in part proceed from the cool anticyclone area and the clear skies favor radiation. Since they are becoming warmer, these winds are not liable to produce either clouds or precipitation. The cool or cold weather back of a cyclone is increased by the active radiation due to the clear skies.

It is readily seen that much of the weather of Missouri depends upon its position with respect to the average paths of the centers of cyclones and anticyclones. By far the larger number follow paths north of Missouri; the state is far to the southward of the average path and this fact in part explains the general southerly direction of our winds. Most of the whirls enter from the northwest, swing around Lake Michigan, and depart through New England or the St. Lawrence Valley. They swing farther south in winter than in summer. They are also the most numerous, strongest and best developed in winter and weakest in summer.

Our severe winter storms are usually caused by a cyclone whose path lies far south of the average paths. The storm of February 14, 1898, is typical (Figure 36). On February 12th a well-defined cyclone appeared in Nevada. As it came eastward it caused northeast-to-southeast winds in Missouri. Warm temperatures and rain occurred in Missouri and the states to the eastward, while snow fell to the northwestward. By February 15th the cyclone had moved northeastward until its center was in New York and the upper Mississippi Basin was in its western quadrants. Westerly winds, clear skies and lower temperatures prevailed during the passage of the western

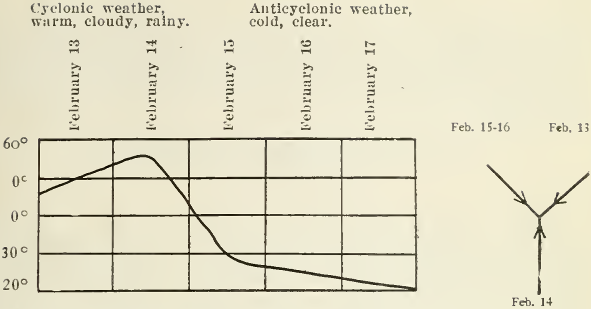

Fig. 39. Generalized weather changes in Missouri during the passage of the cyclone and anticyclone, Feb. 13-17, 1908. (Figure 36). The wind arrows at the right show the changes in wind direction.

quadrants of the cyclone and the following anticyclone. During the five days occupied by the migration of the cyclone and the anticyclone the temperatures in the state had a range of about thirty degrees. The changes during this time are shown in Figure 39.

The "cold waves" occur during the passage of cyclones. If the cyclone center passes south of us, a blizzard is likely to ensue. "Hot waves" occur typically when a sluggish cyclone to the north of us draws southerly breezes for many days. Occasionally a sluggish anticyclone moves in a southerly path and forces warm air over the northern states. Again during July and August, there are few cyclones and anticyclones. The high temperature is due largely to insolation and the absence of cooling breezes is due to a lack of or weakness of, cyclones.

Frosts.—As a climatic factor conditioning many crops, frost is extremely important. For example, the summer temperature and rainfall of much of Missouri is favorable for cotton growing, but the frost-free season is for the state as a whole too short for the present varieties. The general conditions favoring frost are clear skies and quiet air. These conditions are best met in the anticyclonic weather of spring and autumn. But frost is largely local, depending on many factors, as the kind of soil, the altitude and the slopes. In general, valleys are more subject to frost than the adjacent hills. The cooler, heavier air of the hills flows down the hill slopes into the valleys, the warm air is displaced and is forced upward. Often the foliage on hill sides shows the usual frost line. As to frost, Missouri is about midway between the Northern and the Southern states.

Perhaps no other geographic factor is so easily and profitably studied as climate. Even each school district has a local climate of its own; especially are frosts, dews, fogs and local rains easily studied. The United States Weather Bureau needs local data and will publish well kept observations in the Monthly Weather Review published at Washington.

VII.—SETTLEMENT OF MISSOURI.

EXPLORATION.

The riparian region of Missouri was early explored, first along the Mississippi and later along the Missouri and its tributaries. The easy portages between the Great Lakes and the Mississippi early led the French voyageurs down the Mississippi. The journeys of Marquette and Joliet (1673) and La Salle (1682) opened the way for the explorer and trader. At least as early as 1700 lead had been found in the Meramec Basin and lead, excepting the precious metals, was the most desirable metal for the trader (39 a). By 1703, it is a matter of record that French explorers had been guided up the Missouri, which at that time was believed to afford a passage to the Pacific (62 a), and it is probable that unrecorded voyages had been made before that time. The French were primarily traders and not settlers, and followed a fur supply that rapidly receded westward. The record of their explorations is found in the numerous place names of streams along the Mississippi and Missouri. The easy pathway, therefore, afforded by the rivers, both from the north and from the south, together with the accessible lead ore in southeast Missouri, expedited the early exploration by the French.

The census of 1790 shows a fairly dense population on the Illinois side of the flood plain of the Mississippi between St. Louis and Chester. Here the river for the most part flows along the western part of its valley, leaving a wide, fairly continuous lowland to the eastward. Accessibility, fertile and easily tilled land, and the lucrative fur trade located a zone of French settlement here and a considerable French population had settled on the Missouri side. The flood plain in the vicinity of St. Genevieve was well settled and there was a considerable commerce in salt evaporated along the Saline River and considerable quantities of bacon and flour were exported down the river to New Orleans and up the river to St. Louis. The fall of the streams flowing eastward from the Ozark border afforded water power by which the flour was manufactured. The lead region of the Ozark Center and Border was settled by both Americans and Frenchmen. Mine La Motte, Bonne Terre and other place names of towns recall the French element in the population. The lead was crudely smelted and found river transportation at St. Louis, Herculaneum and St. Genevieve, whence it was shipped to points along the connecting rivers, to the eastern states by way of the Ohio and to the West Indies from New Orleans. The Lewis and Clark expedition in 1804 advertised Missouri and opened the way for settlement and further exploration. From the Missouri and Mississippi a skirmish line of trappers went up the tributary valleys and opened the way for settlement. Many of the traders and trappers settled and formed nuclei around which settlements gathered.

SETTLEMENT.

General Factors.—Like the topography and climate, the settlement of Missouri was only partially local; it was a part of a general westward movement from the East. The rise of steamboat navigation, the completion of the Erie Canal, the cessation of Indian hostilities and the large number of Europeans forced into America as a result of the Napoleonic wars, were some of the larger factors that hastened immigration westward (66 a). This migration into the Middle Mississippi Basin was largely directed by two national highways. The Mohawk pass in New York offered an easy roadway to the Great Lakes, with the result that the northern parts of the states bordering on this great highway were largely settled from New England and New York. To the southward the Ohio Valley offered a natural route from the Middle Atlantic States, and in consequence it was followed by settlers from Pennsylvania, Virginia, the Carolinas, Kentucky and Tennessee. The line of westward movement was an irregular line extending far up the valleys and bulging to the southward until with the opening of the Erie Canal and the extension of east-west railroads the line of settlements extended northwesterly.

Missouri lay across one of the principal lines of westward movement. Both the Mississippi and the Missouri valleys led away from the Ohio Valley route. Missouri was very largely settled from the states of the northern South. In 1850, of those not born in the state, 12 per cent came from Kentucky, 8 per cent from Tennessee and over 45 per cent came from the slave states. The Kanawha, Cumberland and Tennessee rivers afforded an easy exit from Kentucky and Tennessee to the Ohio. The soil and climate were not unlike those of the home states, and while many of the settlers did not own slaves, yet they were accustomed to slavery. Moreover, since by the Ordinance of 1787 slavery was excluded from the states north of the Ohio, Missouri was somewhat more congenial to settlers from the South, although it must be remembered that in 1850, when we have the earliest census statistics on nationality, over 30 per cent of Missouri's inhabitants came from northern states. The state was well known along its main streams, since trappers and fur traders had been long at work before the Lewis and Clark expedition in 1804. Just as New Englanders found a climate and glaciated topography familiar to them in the Northern Mississippi Basin, Southern settlers found institutions, climate, and, in some degree, soils to which they were accustomed.

Settlement of the Physiographic Provinces.—The Alluvial and Loess Belt was naturally early settled, although the lead regions of the Ozark Border and Center were early explored and thinly settled. However, like most mining settlements, the latter regions were not sought by home seekers and their population was somewhat transient. By 1810 the Mississippi Flood Plain below St. Louis was settled by an agricultural population and a line of settlement extended back about 50 miles from the river (14 a). The settlement, however, did not move steadily up the alluvial lowland, but leaped from St. Louis to the famous "Boone's Lick Country," where the flood plain and Loess Belt widens and graded valleys extend far to the northward. The flood plain from St. Louis northward along the Mississippi is largely on the Illinois side. The settlement along the Missouri extended in a dense zone by 1830 to the Platte Region which was yet in control of Indians (Figure 40).

There were many reasons for this early settlement along the alluvial lowlands and adjacent loess belt. They were easily reached by boat and the river afforded an easy journey to markets. The soil on the natural levee along the river is a sandy loam, easily tilled and fertile. Water supply and timber were at hand. The settlement of the prairies was deferred in most of the prairie states until the bottom lands had been taken up. There was a widespread misadaptation due to the fact that the immigrants from the East were unused to prairies (12 a). The prairies were exposed to the sweep of the winds and were considered bleak and inhospitable in winter. There were few springs, and water for man and beast was not always easy to obtain. In many instances the first cisterns were unsuccessful wells that were allowed to fill with rain water. The relatively impervious clay held the water and furnished a cheap cistern. The soil was very tough and difficult to plough with the implements then in use. The prairies were for the most part devoid of timber and this was considered as an indication of infertility, for the better lands in the East were timbered. Moreover, the timber was needed for fuel, fences and cabins. The flood plain soils were timbered, easily available and the herbage of the moist areas remained green through the winter and afforded winter pasturage (14 b). The discovery of the fertility of prairie soil was largely accidental and for nearly a generation the prejudice persisted.

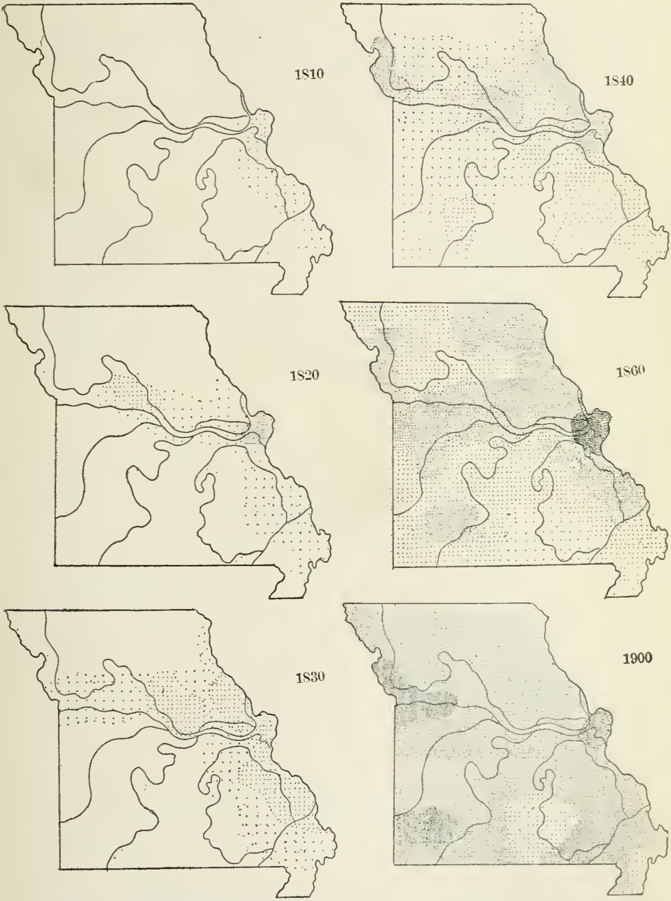

Fig. 40. Population per square miles of Missouri at different decades in the different Physiographic divisions.

There were many disadvantages associated with life on the flood plain. Portions are subject to yearly floods and every few years practically all the lowland is under water during the June floods. Buildings, fuel, fences and stock were swept away. After each flood there was usually an epidemic of malaria or "river fever." Portions of the flood plain enclosed between the bluffs and the river often were social units and were settled by relatives or former acquaintances. After a flood an entire community would often emigrate elsewhere, frequently to the prairie.

It was fortunate that the wide flood plain in the Boone's Lick country was bordered by the wide loess belt. When because of the floods, the malaria or the pressure of incoming immigration, the flood plain settlers moved on, they found near at hand the loamy loess, which, in contrast to the prairies, was well drained and its soil was much more easily tilled than the heavy clay of the adjacent prairies. The movement to the loess belt was not sudden, as a whole, and was presaged by the use of that belt for summer pasturage. The early and dense settlement in the Boone's Lick country was perhaps accelerated by salt springs which afforded this useful commodity and gave the name to the region.

The population maps show that the dense population rapidly extended along this belt up the Missouri in marked contrast to the less rapid growth along the flood plains of the Mississippi below St. Louis. It is an interesting fact that during the latter part of the slavery period the slave population was most dense on the flood plain and loess belt of the Boone's Lick country (Figure 41).

The Ozarks.—The entire Ozark region was explored earlier than the prairies. The mineral deposits in the eastern part tempted further explorations to the westward. It is not improbable that De Soto penetrated the southeastern Ozarks in his fruitless search for gold. The more advanced dissection of this region gave numerous valleys and streams, many of them navigable, which guided traders, hunters and explorers up to the top of the Ozark dome, whence tributaries of the White River led westward. Then again the more numerous water courses and the larger forested areas along them afforded haunts for numerous fur-bearing animals. Hence a very sparse hunting population was rather early distributed over the Central Ozarks.

The Ozark Border.—The settlement of the eastern border has been mentioned and was largely agricultural. The limestone belts of the eastern border and the nearly graded lower parts of the valleys gave fertile soils. Mill sites along the upper courses of the streams were abundant and there was a good market for flour down the river. A considerable part of the lead mining was done by farmers who owned the land and gathered the ore during the winter and at times when they were not otherwise employed. The early settlers were largely French, but Americans soon outnumbered them. By 1820 a considerable colony of Germans was in the Cape Girardeau district (10 a), where many of their descendants still remain.

The further permanent settlement of the Ozark Border did not, as might perhaps be expected, extend westward from the densely settled eastern part, but began in the southwestern portion in the Springfield region. Early settlers entered this part by way of the White River which, together with its master stream, the Arkansas, was navigable. Light draught steamboats early came up the White River into this region. This area, moreover, was the focus of several well traveled routes. Here crossed roads from the southwest to Boonville on the Missouri and to St. Louis, the latter road pursuing the well-defined divide now in large part followed by the Frisco Railroad. Another feature that attracted the settler from the mountainous districts of Kentucky, Tennessee and adjacent states, was the many excellent springs. They gave a widely current appellation to all southwest Missouri, which was known as "The Boils," often corrupted to "The Bulls." But the feature that led to the rapidly increasing density of population here from 1840 to 1860 was the excellent agricultural possibilities. Here the Border is wide and generally prairie like. The soils are fertile and easily tilled and there was a fair market, although the expense of getting bacon, cattle and flour to the river

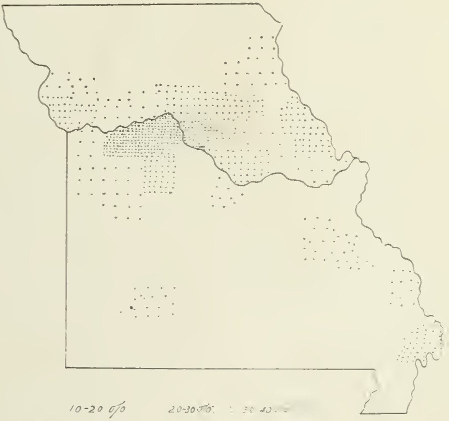

Fig. 41. Map showing the distribution of slaves in 1860.

for transportation was heavy. Cotton was grown for local use, but was often cut down by the frosts. The settlers from Kentucky and Tennessee brought their habits of hemp culture which continued until war times. The southwestern border sent much of its products overland to river towns to supply the Santa Fe trade.

An especially dense population in the southwestern part of the Border is due to the mining of zinc and lead. About 1849 lead was discovered near Joplin, but it was not until over twenty years later that mining was actively begun here (39 b). At first the zinc was thrown away. Previous to about 1880 the lead was transported for shipment to river points, such as Linn Creek on the Osage, Boonville on the Missouri and Fayetteville on the Arkansas (39 c). About that time three railroads reached this area and mining received a new impetus. The area has been very productive. The large mining population furnishes a good market for the farm products of the surrounding region in the Ozark Border, the Old Prairie and the Ozark Plateau.

A particularly interesting incident in the settlement of the narrow part of the northern Ozark Border was the Hermann settlement (56). The German Settlement Society of Philadelphia in 1837 founded a German colony here. The instructions to the commissioners who located the colony were, among other things, to search in Illinois, Indiana, Missouri, Wisconsin and Michigan for a region of good agricultural possibilities on a navigable river where a large city might grow. The site of the hoped for emporium was chosen near the confluence of the Gasconade and Missouri, a situation possibly suggested by the confluence of the Schuykill and Delaware at Philadelphia, the home of the society. It was hoped that the iron and lead region might, upon further prospecting, be found to extend into the purchase. It was noted that the land, although hilly, was suitable for pasturage, fruit, and for grapes, that the soil was derived from limestones, and that there were abundant springs. Soon a German colony of several hundred was located. Dissensions soon broke out, the colony was dissolved in 1839 and Hermann did not become a rival of St. Louis. Nevertheless, by their industry and frugality, the Germans and their descendants have become highly prosperous in a moderately dissected region and from a soil only moderately fertile, a soil indeed that in some parts of the Border would be largely given over to pasture.

The Ozark Center and Plateau.—Here again the presence of easily obtained lead ore led to early settlement in the lead region. There was a settlement in Mine a Breton (Potosi) as early as 1775 (62 b), the Murphy Settlement (Farmington) was made in 1798 and Fredericktown in 1800 (47 i). The crudely smelted lead was valuable enough to allow pack horse transportation to the Mississippi or boat carriage down the Meramec. The rich iron ores in Iron County early attracted attention, and furnaces were erected as early as 1815 near Pilot Knob, for which the abundant timber furnished charcoal (62 d). This industry grew until the middle of the nineteenth century and the hopes of developing the supposed extensive iron ores directed one of the earliest railroads (Iron Mountain) to this area. The forests of the Center and especially the pine forests of the southern part of the Plateau yielded considerable merchantable timber. Saw mills were in operation and timber was rafted down the Gasconade by 1832 (60 a). The Ozark Plateau with its timber growth, its dissected topography and its climate in many ways resembled the Cumberland Plateau of Kentucky and Tennessee and the Plateau was largely settled from these states. The early settlers took up land along the flood plains in the narrow valleys and used the relatively unforested divides for pasture, much as they had done in their former environment. These provinces have been slow in settlement except in the productive lead districts, and much of the area must remain uncultivated. In the southern part of the Plateau fruit growing has been successfully developed.

The Old Prairies.—These were not distant from the great highway of the Missouri and were bisected by the Osage, upon which there was early flatboat navigation (15 a). An early center of settlement and trade was at Harmony on the Osage in southeastern Bates County. Here in 1821 was established a missionary station by a Boston society and this served as a nucleus for settlements. As elsewhere, the open prairies were at first avoided and settlers chose the timbered belts along the streams. As late as 1852 the prairies were held in light esteem. However, the Indian trade to the southwest and the Santa Fe trade gave good markets for flour, bacon and oxen, and the country was rapidly settled between 1840 and 1860. Cotton was grown for home use but, as elsewhere, it was an unreliable crop owing to the frosts.

The Glacial Prairies.—These prairies were rather slowly settled in view of their great productiveness. In the great rush to Boone's Lick Country the southeastern prairie was on the line of the main road and by 1820 settlement had been well begun between St. Louis and the Boone's Lick area, although it required more than two decades for this part of the prairie to reach the density of the Boone's Lick region 70a. The hilly, rolling land parallel to the Mississippi was next settled. Easy communication by the river was one factor in this settlement. The same prejudice in favor of hilly or rolling land prevailed here as elsewhere and, moreover, from the records obtainable it appears that a considerable area in this belt, even on the prairie, was timbered and timber always appealed to the eastern emigrant. A good market for the northeastern counties was found in the Wisconsin-Illinois lead region (15 b).

Bek, who in 1823 wrote a widely read Gazetteer of Missouri, lent his influence to the prejudice against the prairie, stating that "Prairies must for long time remain wild or uncultivated." Flint, who for some time resided near St. Charles reflected this general opinion when he stated that the prairies are "generally too destitute of wood to become habitable by any people other than hunters and shepherds" (11 b).

During the "Mormon war" in 1836, in the northwest, it was proposed to allow the Mormons and Indians to occupy the flat divides on the ground that they were "good only for Mormons and Indians." Hence it was that the skirmish line of settlements extended in narrow belts along the timbered valleys. It took more than a generation's experiences to find the value of prairie soils. Indeed many elderly men can well remember this idea which they themselves have scarcely yet overcome. The prairie, distant from the large rivers, lacked easy transportation and it was not until the completion of the Hannibal and St. Joseph railroad that the rapid settlement began. Before that time settlement had moved into the prairie from the rivers in the east, south and west.

The growth of the different physiographic divisions is brought out in the graphs of Figures 42 and 43. The rapid settlement of the Ozark Border, the New Prairie, the Loess Alluvial Belt and the Old Prairie continued until about 1880 and have decreased since 1900. The Ozark Center and Plateau have been more sparsely and slowly settled and their population is still gaining, but more slowly than before 1880. The lowlands slowly gained in population up to 1890 and their rapid increase since then is in mark-

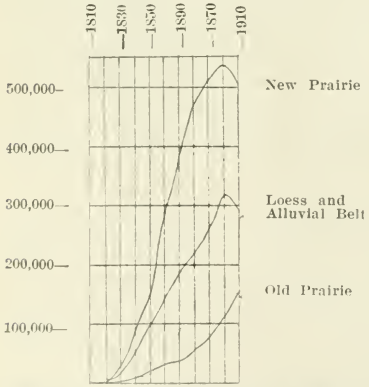

Figure 42. Graphs showing the growth of population in the New (Glacial) Prairie, the Loess and Alluvial Belt and the Old Prairie.

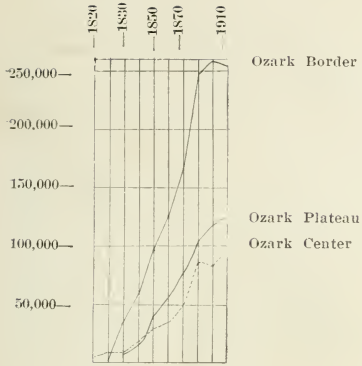

Fig. 43. Graphs showing the growth of population in the Ozark provinces.

ed contrast to that of the other provinces. Until the available lands surrounding them had been occupied, settlers did not occupy the lowlands, where expensive drainage was necessary. This area is now having the boom that was experienced a generation ago in the other provinces.

DEVELOPMENT OF CITIES.

While cities and towns accompany settlements, they present different problems from a geographic point of view and are therefore considered separately from the settlement of the different physiographic provinces. A city will develop wherever population is concentrated by trade, manufacturing, or otherwise.

Political Towns.—These grew up about administrative centers. Jefferson City was placed west of the center of population at that time and near the geographical center of the state. Its growth has been almost entirely due to its position as the state capital. It has a limited hinterland and but for its political advantage would probably not have attained its present size. St. Louis and Cape Girardeau are examples of towns whose growth was accelerated by their position as **military posts.** In later paragraphs it will be seen that many towns and cities in Missouri owe much to their position as political centers.

Industrial centers may develop in a region of distinctive industry or in a territory with varied needs. Joplin grew to supply a center connected with the mining of lead and zinc. St. Louis, with its varied manufactures, has no especially distinctive industry, since its hinterland has varied products and needs.

Commercial centers.—Such centers grow where the trade of an area is concentrated and such concentration is almost invaribly due to a meeting of routes. At such a convergence the commerce and manufactures for the tributary area or hinterland are focused and carried on at maximum advantage. Here is the meeting place of raw materials and factory, the distribution of materials and the concentration of capital.

For such a focussing of routes English geographers have suggested the term **nodality**. St. Louis owes its early growth to its favorable river nodality. Springfield's growth was due to a nodality caused by the crossing of natural overland routes. Warsaw and Tuscumbia were ferry towns where land routes crossed the Osage and afforded a combination of land and river nodality. Artificial nodality is created by the meeting of railroads or canals and is to be associated with those means of communication. A very pretty instance of shifting nodality was seen when the Missouri Pacific was building. The construction just preceding the Civil War was not steady, but intermittent. The railroad reached Tipton, and this town remained the terminus for a year. Here concentrated the mail and trade routes to the southwest and high hopes of a future metropolis were aroused. The next year the railroad was extended to Otterville, and this in turn became the center of trade, many houses being moved from Tipton. Smithton was the next terminus and finally the railroad reached Sedalia, where further construction was delayed by the war. Here the terminus remained for several years. Besides being a commercial center, Sedalia was the shipping point for vast quantities of military stores used in the military movements of that locality. Moreover, Sedalia was located in a fertile, rapidly settling prairie region and by the time the railroad was built westward Sedalia had secured a momentum which she was able to hold. Later the railroad machine shops were located here and the importance of the town directed other railroads hither, so that Sedalia is an important railroad junction point.

Distributing Towns.—If in a considerable area the distribution of population, products and commercial facilities were precisely equal throughout, it could readily be imagined that at equi-distances of say ten to twenty miles, distributing centers would spring up. At these centers the produce of the local hinterland would be marketed, local factories and retail stores would be provided to meet the local demands, and banking facilities would be established. In some parts of Missouri, especially in the uniform Prairies and Mississippi Lowlands, such an ideal arrangement of distributing centers is closely approximated. It was a generally observed rule to locate the county seat near the center of the county so it would be easily accessible from all parts of the county. These political centers, in the absence of towns with greater geographic advantages, became the chief distributing centers of the counties and have frequently become important cities. When railroads were built, if the county seat was not reached, it was frequently changed to a position on the railroad.

Railroad Towns.—Railroads in large measure took the place of the rivers as lines of trade. Cities like Mexico and Moberly grew up at railroad junctions. The location of railroad machine shops, as in the case of De Soto, has been an important factor. The site of Slater in Saline County in 1875 was a corn field, when it was made a division point on the Chicago and Alton Railroad. In a few years it has become a small city.

It is seldom, of course, that any one factor is solely responsible for the growth of a town. Different factors may be in operation at different times. One factor may be predominant at one time and quite another at a later time. A city's growth is always due to a complex of factors of which the geographic factor is only one. A study and analysis of the growth of one's own town is always interesting and is well worth doing both for education and for information. Much can be done in the schools along this line and the study of one's own town will pave the way for the understanding of the great cities of the world. Furthermore, these studies should be printed in state educational journals, and local papers are usually glad to print local studies. It is only by such means that an adequate geography of Missouri can ever be written.

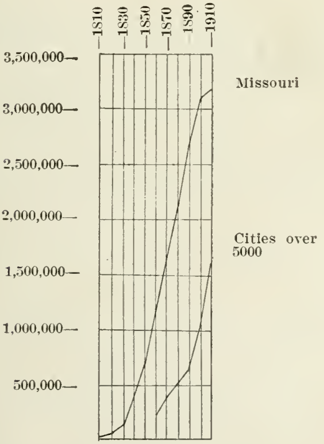

Fig. 44. Graphs showing the increase of population of Missouri and of cities of over 5000 population.

The foregoing principles will be briefly applied to some of the larger cities of the state and to some of the more notable geographic movements affecting city growth. The problems of the cities and towns have become especially interesting in view of the fact that a large percentage of our population is urban and the last two censuses show the movement to the cities to have been especially rapid (Figure 44).

Since the alluvial belt was early and densely settled, naturally we find here the earliest important towns. Reflecting the prevailing industry, these towns often were first trading posts established to handle the fur trade. As the fur trade receded westward and the fertile flood plain was settled, these towns became trading points for the adjacent region.

The growth of Ste. Genevieve is typical of many of these towns. It is probably the oldest town in Missouri. It was an early shipping port for the salt made in the adjacent Ozark Border and by 1735 was a port for lead shipments from the Ozark Center and Border to the westward (13a), (71a). Ste. Genevieve became an important shipping point for the corn and wheat that were produced in the adjacent flood plain. It was a competitor of St. Louis as late as 1820 (71 c). Prior to the completion of the Iron Mountain railroad, Ste. Genevieve was a shipping point for the smelted iron of the Ozark center. At Ste. Genevieve and Herculaneum the lead was in part manufactured into shot, the bluffs here offering good facilities for shot towers which were early located here.

Geographic factors were influential in the growth of New Madrid. A low ridge, locally called "The Big Prairie" crosses the Mississippi at this point (Figure 21). This ridge leading northward offered a dry road which was an important Indian trail and afterward became an important road connecting New Madrid with Ste. Genevieve and St. Louis (62 e). Big Prairie and other less pronounced ridges in the vicinity were generally treeless and arable. A wide "slough," the Bayou St. John, joined the Mississippi here and afforded a harbor for the light draft vessels engaged in the Ohio-Mississippi traffic (11 c). In 1826, Flint records that one hundred boats could be counted on the bayou (10 b).

This favorable site was occupied by a Delaware Indian village and several other Indian villages were in the vicinity. The extensive marshes and sluggish streams furnished a favorable habitat for fur-bearing animals and a fur trading post was early established by French traders from Kaskaskia (62 e). Many flatboats coming down the Ohio with cargoes would discharge at New Madrid rather than attempt the difficult journey up the Mississippi. In consequence of these favorable factors, New Madrid rapidly grew in importance and with Natchez became the most important port between St. Louis and New Orleans (11 a). About 1790 American farmers began to settle in the vicinity and the exports of corn of 6,000 bushels in 1794 had trebled by 1796 (67a). But the importance of New Madrid rapidly dwindled. Its position on the outside of a meander (Figure 45) subjected the site to constant erosion and the town has been moved away from the river several times (14 b). Indeed, were it not for the continuation of the Big Prairie across the river a cut off would undoubtedly have long ago occurred and New Madrid would be deserted. The earthquakes of 1811-12 almost depopulated the adjacent lowland and it has only rather recently recovered.

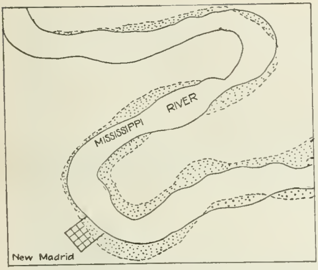

Fig. 45. The New Madrid bend. The dotted areas show where the banks were eroded from 1883 to 1902. (Mo. River Commission).

The Cape Girardeau district was largely settled by Americans, although a German settlement was located along the White Water River as early as 1799 (62 f). Early in the nineteenth century the town on the bluffs was founded and an administrative post was established from which a considerable Indian trade was carried on. The flood plain in front of the town was productive and exports of corn, wheat, tobacco, stock and cotton were important. The town was not on the river and had no especial advantage as a local commercial center and when the county seat was moved to Jackson, Cape Girardeau lost its early importance.

Together with the adjoining country, the river towns north of St. Louis were slow in developing. Hannibal, at the confluence of Bear Creek and the Mississippi, was an important trade center for the northeastern counties, but its growth to a city began with the completion of the Hannibal and St. Joseph Railroad. Louisiana, also at a confluence of a creek valley with that of the Mississippi, was an important trading point.

With the rapid settlement of the Boone's Lick Country came the demand for a trade center, and with singularly poor judgment the town to meet this demand was Franklin, situated in the flood plain opposite the present town of Boonville. Franklin was founded in 1817 and at once became the distributing point for the Boone's Lick Country. The town in its short career was the prototype of Kansas City. In five years it became the starting point of the great Santa Fe trade (58 b). It was the western point for immigrants from which they could look over possible places for settlement.

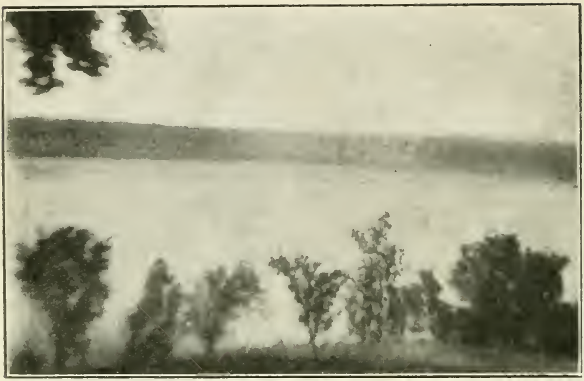

Fig. 46. Looking from Boonville across the Missouri toward the site of Old Franklin. The sand bars in the middle ground are a part of the old site.

But Franklin, situated at the river's bank on the flood plain, within nine years after its founding, began to see its site eroded and by 1832 its site was virtually abandoned (Figure 46). The inhabitants, often moving their buildings with them, went to the bluffs and founded New Franklin or crossed the river to Boonville (70 b). This town on the bluff, where, as Wetmore pompously expressed it, the Missouri's "proud waves shall be stayed," succeeded to the Santa Fe trade, and to much of Franklin's importance. The growth of towns along the river kept pace with the rapid extension of settlement along the flood plain and loess belt. Providence, Rocheport, Glasgow, Brunswick, Lexington, Westport and many others sprang up between 1820 and 1840.

In the early river towns we see a common misadaptation of site to the habits of graded rivers. It is true that the towns along the rivers in the east were subject to floods, but the rivers there, as a rule, do not have the habit of strong lateral erosion characteristic of graded streams.

Ste. Genevieve was first located on the flood plain about three miles below the present town, but by 1784 the frequent floods and lateral erosion drove the people to the safe site on the bluffs (62 b). At Franklin the settlers had believed that the interlacing tree roots would protect their site from erosion, but within a few years the river covered the site. Glasgow was preceded by two unsuccessful towns in the flood plain, Chariton and Thorntonsburg, from which the people were driven by floods and the succeeding malaria. Old Brunswick was an experiment on the flood plain, but here again the people were forced to the bluff site of the present town. Many other towns suffered the same fate and are now known only by their locations on old maps.

Settlers soon learned to locate towns on the bluffs above the zone of floods or erosion. As the country developed, they located their towns where the river impinges against the bluff and, if possible, where, at the same place, a stream and valley debouches into the Missouri. Rocheport on the bluff at the confluence of Moniteau Creek had a warehouse in 1820 and became a thriving town and the center of a considerable boat building industry. Glasgow at the confluence of the Chariton and Brunswick at the confluence of the Grand and Missouri were distributing points for the basins of those tributaries. The principal confluence towns were on the north side of the Missouri, since the longer tributaries leading into the prairies were on that side. No towns of importance grew up at the confluences of the Missouri and the Gasconade or the Osage. The former river led to the thinly settled Ozark Plateau and much of the surplus products of the upper Osage found a local market or was drawn for shipment to Boonville and the towns above. Hermann was founded near the confluence of the Gasconade and Missouri that it might benefit from the river nodality. The adjacent hinterland was not productive enough to support a large distributing center and, furthermore, St. Louis was too near.

Prior to the construction of railroads paralleling it in the sixties,

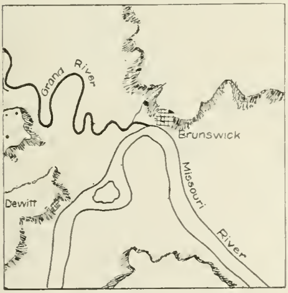

Fig. 47. Course of the Missouri near Brunswick in 1817. (after the Annual Rep't of Engineers for the Missouri River, 1881, Appendix S).

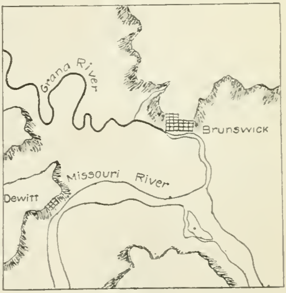

Fig. 48. The Missouri in 1887. The river has cut across the neck of the meander, leaving Brunswick several miles to the northward.

the Missouri River was an important line of commerce. The regular steamboat traffic began about 1830 and from then until the sixties scores of boats traversed the river (59 a). Important towns grew up along the stream, especially at the point of favorable nodality. With the decadence of steamboat traffic the towns lost their prosperity unless they were reached by a railroad. However, many of the towns were so important that railroad routes were made to touch them. Brunswick, although practically cut off from the river in the seventies, became a railroad junction and has retained importance (Figures 47 and 48). Lexington, Glasgow, Boonville, St. Charles and Louisiana were of such importance that railroads crossed the river at these places. An interestng result of the importance of the river zone is seen in the density of educational institutions. Of the colleges and academies in the state founded prior to 1870, but few are more than twenty miles from the Missouri or the Mississippi.

ST. LOUIS.

General Position.—The area adjacent to the confluence of the Mississippi, Missouri and the Illinois must invariably contain an important trading center as the region became settled. Here was the natural focus of trade for the productive basins of the upper Mississippi and the Missouri Rivers that were, together with many of their tributaries, navigable.

The local position of the future St. Louis might be at several places, although the present site is probably the best in the area. Like so many other of our cities, St. Louis began as a trading post, and the selection of the site is due to the sagacity of Laclede Linquest. Laclede, as he is usually called, wished to establish a post for an extension of trade, of which he appears to have had the monopoly for the Missouri and part of the upper Mississippi, although this is doubted by some historians (62h). He considered several sites, among them Ste. Genevieve, then on the flood plain. St. Louis was finally chosen for several geographic reasons. Here the river, meandering in its broad flood plain, swings against the western bluff, thereby giving deep water at a site safe from lateral erosion and floods. Laclede showed his wisdom in avoiding the usual site of early towns in the flood plain, such as the logical site at the exact confluence of the two rivers. There was enough timber in the adjacent prairie to furnish fuel and building materials. Moreover, he brought from France the idea of the importance of mill sites and rightly believed that the small streams tributary to the Mississippi would furnish water power, although he probably overestimated their importance.

Founded in 1764, the post at once became important. The population was suddenly increased by the influx of French families who migrated across the river after the cession of the country east of the Mississippi to England (72 a). It soon became an important civil and administrative post.

River Influences.—Prior to the steamboat area when cargoes must be light and of high value, the fur trade was dominant in St. Louis, although considerable lead found shipment from there to the south and east. Furs were used as currency nearly until statehood days and a large proportion of the population was absent during the trapping season. The agricultural possibilities of the adjacent prairie and flood plain were neglected so that frequently the breadstuffs were imported from Ste. Genevieve and other places down the river. The converging trade of the three rivers made St. Louis one of the leading fur centers (69 a) and today, long after the decline of river navigation, St. Louis is the leading center for raw furs, although the value of this industry is far exceeded by that of many others.

It was not until the development of steamboat navigation that St. Louis reaped the full value of her river nodality. The steamboat far exceeded the flatboat in capacity, speed and the ability to carry freight up stream. The "General Pike," which arrived at St. Louis in 1817, was the predecessor of a fleet that grew so rapidly that, about twenty years later, the number of steamboat arrivals was 2,050 (61 a), and the cash value of the river fur trade in 1817 amounted to $600,000, a very large sum in those days (71 b).

The steamboat carried not only the rapidly increasing fur consignments, but as the fertile flood plain and loess belt were settled, bacon, hides, flour, hemp and tobacco came to this port for transportation down the Mississippi. The city became known as a hemp, lead and tobacco center and still remains the principal tobacco manufacturing center of the United States.

As the steamboats became larger a river factor of great advantage became evident. Below the mouth of the Missouri, the depth of water in the Mississippi becomes notably greater with the combined flow of the two rivers. St. Louis was therefore the meeting place of the heavier boats of the lower Mississippi and the lighter boats of the Missouri and the upper Mississippi. Boats could run from St. Louis to New Orleans at the lowest stage of water (8 a). At such a point of transfer warehouses, mercantile establishments, manufactories, banking houses and other establishments incidental to the growing commerce were established. The Santa Fe trade had its distributing center at St. Louis. The value of the river landing was strikingly shown in 1835 when a serious depreciation in real estate occurred because the Mississippi threatened to change its channel toward the eastern bluff, a misfortune that was averted by engineering operations.

Development.—With such a momentum due to its river nodality, St. Louis attracted first the principal overland routes and later the railroads. By 1830 St. Louis was the western terminus of the important road from Pittsburg and of the post road from Louisville. In the fifties the Ohio and Mississippi Railroad reached the eastern bank of the river opposite St. Louis and opened railroad communication with the East. However, in the development of railroads, St. Louis was much behind her great rival, Chicago (Figure 49). This retarded development was due in part to the confidence that St. Louisans had in their geographic position which prevented greater activity in promoting railroad building (65 a). During the sixties railroad construction went on rapidly in Missouri and adjoining states and St. Louis became a center of converging eastern and western lines. Meanwhile, as elsewhere, river traffic had declined with the building of railroads. In 1871, 33 per cent of the freight handled at St. Louis came by boat, but sixteen years later the percentage was only 10 (71 d). The growing importance of St. Louis, however, as a railroad center more than offset the decline in river transportation.

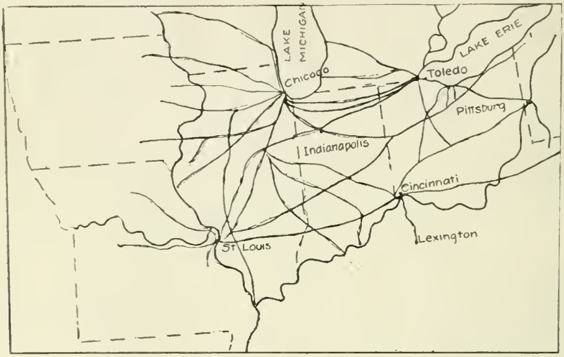

Fig. 49. Railroads in the Middle West, 1850-60 (after Coman).

During the Civil War St. Louis, with its converging railroads and southern river route, was the Federal base of supplies for the western operations and a considerable volume of business was derived therefrom and the population rapidly increased from 1860 to 1870 (Figure 50). The trade with New Orleans was shut off, with the important

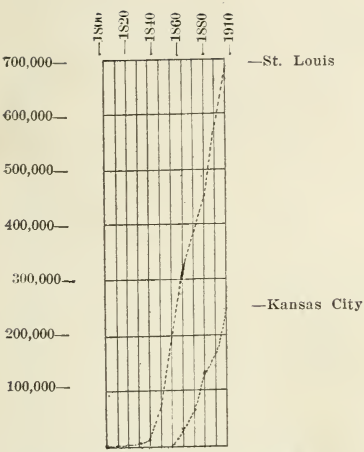

Fig. 50. Population graphs for St. Louis and Kansas City.

result that extensive trade connections were established with the East. After the war, therefore, the business of St. Louis that had previously been largely to the southward had extended in all directions.

Today St. Louis is the emporium for the Southwest, which is its main hinterland. The varied and extensive manufactures reflect the growth and demands of a hinterland that is rapidly becoming populous and wealthy.

KANSAS CITY.

A somewhat unique geographic factor explains much of the growth of Kansas City. The Missouri here makes an abrupt bend from a northerly to an easterly direction. Traffic for the southwest, especially for the great Santa Fe trade, left the steamboat and took the wagons and at the portage between the two modes of carriage was the place for a prosperous town.

The advantage of the site at the confluence of the Kansas and the Missouri rivers was early appreciated and in the early twenties a trading post was established here by the American Fur Company. The fur trade of the post was important during the entire river period. This nodal position, however ,offered no especial advantage over half a dozen others along the Missouri. It was only when the proper response was made to the abrupt bend of the Missouri that Kansas City had the reward of its position.

The Santa Fe trade was essentially an exchange of food, wearing apparel and general necessities for the gold, silver and pelts of the upper Rio Grande Valley. The Mexican products were of high value and small bulk and could, in consequence, bear the high cost of transportation by wagon. The high profits of one hundred to five hundred

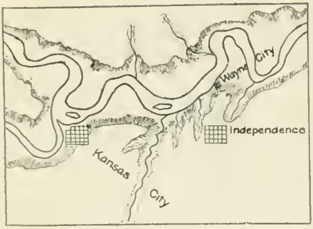

Figure 51. Vicinity of Kansas City and Independence.

per cent and the relatively small capital needed to equip a wagon and teams attracted hundreds of traders to the traffic.

The first river terminus of the Santa Fe trade was at Franklin, but in a few years its terminus had shifted up stream to Independence, nearly its logical geographical position, which was laid out about 1833 (63 a). Here the prairie extends close to the river trench (Figure 51) with ravines extending down to the flood plain. There were two landing places in the flood plain for cargoes to Independence; one at Wayne City and the other at Blue Mills, six miles below Independence (64 a). The open prairie gave facilities for deploying the long ox teams by which the wagons were moved (54). Here assembled the stores, warehouses and shops connected with the traffic and for ten years or more Independence flourished as the eastern terminus of the Santa Fe route.

There were two disadvantages that finally transferred the terminus from Independence to Westport, as Kansas City was then known. The river landings for Independence were on the flood plain and subject to overflow and erosion, and Independence was several miles from the great bend of the Missouri. Moreover, at Kansas City the river swings against the bluff, giving at once deep water and a landing secure from erosion. As competition became sharper the profitable Santa Fe trade again shifted to Kansas City, which gained the leadership shortly after the Mexican War (63 b). Kansas City remained the main eastern terminus of the great Santa Fe trade until the Civil War, although other towns, notably Independence, Leavenworth, Atchison, Omaha and St. Joseph shared in the traffic. Not only the Santa Fe route, but other important overland routes and trails centered in Kansas City and the towns along the Missouri (Figure 52).

Besides the large amounts of commodities that were handled, another factor growing out of the Santa Fe trade contributed greatly to the prosperity of Kansas City and the other towns along the Missouri. A considerable amount of metal money was brought back from Mexico and this, in the days of bank notes of variable value, gave a stability to the circulating medium and tided the people over the panic of 1857 (57 a). The entire "Border money" in 1858 was estimated to

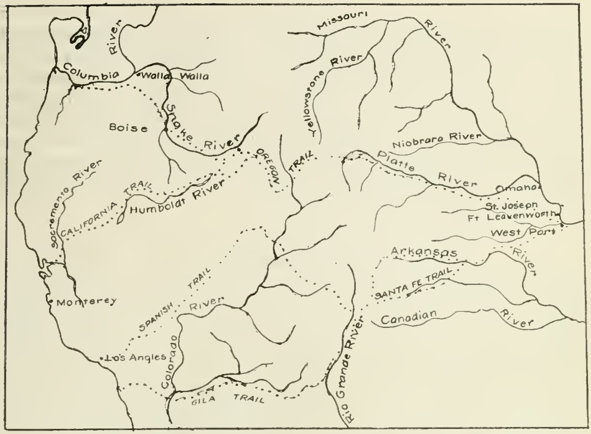

Fig. 52. Overland trails centering near Kansas City (after Semple).

amount to over $5,000,000 in value, much of which passed through Kansas City (68a). In speaking of the Santa Fe trade, it must not be overlooked that Kansas City was the center and shipping point of a fertile region that was rapidly increasing in population, exports and wealth; but the trade of this region was shared with other towns while it had almost a monopoly of the Santa Fe trade.

With the extension of railroads in the decade from 1860 to 1870 the river traffic on the Missouri declined very rapidly and the future of Kansas City lay in its ability to attract the railroads. During the war the business of Kansas City was all but suspended, while its rival, Leavenworth, was the base of Federal military operations and was prosperous. Kansas City, however, had gained such a momentum that railroads could not afford to pass it by. In 1860 the intention was to locate the western terminus of the Missouri Pacific at Independence, but in 1865 it was located at Kansas City (57 b). The Santa Fe was forced to go into Kansas City, although it was at first intended to build to Topeka (57 b). Thus it came about that Kansas City early became the principal railroad center of that part of the Missouri Basin, although it had no particular advantages for railroad construction and for a time the Missouri was more of an impediment than an aid. The last five years has seen a resumption of the river traffic at Kansas City that promises a renewal of something like its former importance.

Kansas City, Missouri, and Kansas City, Kansas, are an economic unit. Their prosperity and growth are due to the transportation facilities of so many converging railroads and to the fertile and populous hinterland tributary to them. The industries of Kansas City are not distinctive like those of Joplin or of Pittsburg, but they supply the various needs of the populous hinterland. Kansas City, together with Omaha, is near the margin of the grazing and corn belts where stock is extensively fed for the market. The beef and pork packing establishments which began in the sixties have increased until the two cities rank high in this industry.

ST. JOSEPH.

The local position of St. Joseph resembles that of St. Louis, in that the Missouri in a broad meander swings against the east bluff whose somewhat dissected appearance gave it an early name of "Rattlesnake Hills." In the twenties Joseph Robidoux, a French trader, established a trading post here which soon became important. It became especially important with the opening of the "Platte Country" in 1836, for which St. Joseph was the most accessible shipping point. The fur trade was soon exceeded in importance by the agricultural products of the flood plain and of the fertile loess belt and St. Joseph became a noted trade center for hemp.

St. Joseph lay on the overland route to California which for a time crossed the river here. Between 1849 and 1851 thousands of emigrants crossed at this point. Moreover, a considerable portion of the Santa Fe trade centered at St. Joseph. A great impetus was given to St. Joseph when it became the terminus of the Hannibal and St. Joseph Railroad in 1859. Cheap communication was afforded with eastern markets, better prices for local products were secured, and the wealth and population of St. Joseph's hinterland as a consequence rapidly increased. By 1873 when the railroad bridge over the Missouri was completed there were three important railroads connecting the city with the East. Like other cities in the corn belt, St. Joseph has become an important center for pork packing, an industry said to have been prominent as early as 1846.

SPRINGFIELD.

The site of Springfield offers no especial advantages over dozens of other possible sites on a broad stretch of prairie of the southwestern Ozark Border. Indeed shortly after the town was laid out in 1835, there was considerable doubt as to its permanence, since it was not at all certain that it would be the permanent county seat. But through this region ran two important convergent routes. One led from St. Louis along the divide, the "Ridge Road," and another from Boonville and other river points, both roads leading to the Indian Territory and Arkansas. Springfield grew on the site of an Indian village about a spring and became the focus of these important roads. In the forties there was an extensive trade in live stock and farm products to the southwest and also to Kansas City for the Santa Fe trade. The fertile prairie was rapidly settled and Springfield was its trade center. When the railroads were built the town was so important that the railroads centered there. The lead and zinc areas to the west have also become in part tributary. Springfield is an important city, a railroad center, the focus of a productive hinterland, and still retains its former trade relations with the southwest.

VIII.—INDUSTRIES OF MISSOURI.

AGRICULTURE.

The position of Missouri as one of the great agricultural states rests primarily on her climate, soils and topography. The climate is midway between that typical of the northern and of the southern Mississippi Basin. The rainfall is usually ample; indeed, the problem of drainage is, for the most part, more important than the problem of moisture conservation. The growing season and the frost-free season are usually long enough for the great world food staples. The summers are hot and usually moist in the early portion and dry during the harvesting season. The clays and loams of the lowlands and prairies are fertile and some are highly productive; the relatively level and undissected topography of these divisions allows extensive use of agricultural machinery.

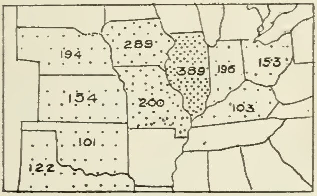

Fig. 53. The states producing 70 per cent. of the corn crop of the United States in 1909. The figures denote the production in millions of bushels.

Missouri produced in 1909 over 7 per cent of the corn crop of the United States. The position of the state in the corn belt is shown in Figure 53. The wheat crop of the state usually has about one-third the value of the corn crop. The wheat growing states and Missouri's position among them are shown in Figure 54. Large amounts of meat pro-

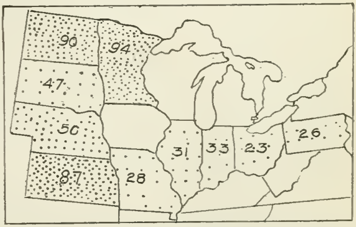

Fig. 54. The states producing 70 per cent. of the wheat crop of the United States in 1909. The figures show the production in millions of bushels.

ducts were carried in the early river traffic and these have increased in value. Cotton has long been grown locally (11 d). It is now grown on a large scale in the southeast lowlands, mostly in Dunklin, New Madrid and Pemiscot Counties. This region with its low altitude, southerly latitude and fertile alluvial soils has a rapidly increasing acreage.

Such climates and soils place the state in the great corn belt, and this in turn accounts for the high rank of the state in swine and beef products. Corn requires a hot growing season, which excludes the crop from the great northwestern agricultural states. The climate and soils of the state are highly favorable to wheat, but wheat is an extensive crop and seeks relatively cheap land and a region not densely populated. Hence the center of wheat culture has rapidly moved westward and is now moving northwestward (Figure 55). The corn center, on the contrary, is almost stationary.

Fruit growing, especially in the lighter soils, particularly in the Ozarks, is an important and growing industry. The success of grape culture in the German colony at Hermann indicates its possibilities in other parts of the state. From the history of the older states it is safe to predict that the agriculture of Missouri will become less extensive and more intensive, especially in the more fertile portions. The average size of farms in the state in 1900 was 119 acres. These farms are capable of supporting a population many times as dense with a system of intensive agriculture.

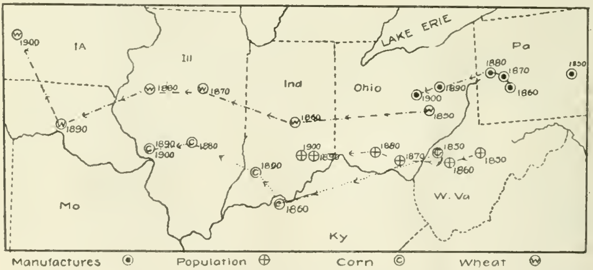

Fig. 55. Map to show the westward movement of centers of manufactures, population, corn and wheat, 1850-1900 (Statistical Atlas, U. S. Census).

The problem of drainage on the flood plains and Southeast Lowlands has been mentioned before. According to the estimates of the National Conservation Commission there are 1,920,000 acres of swamp and overflow lands in Missouri, or about 4 per cent of the entire area.

Most of this area is comparatively easily reclaimed by gravity ditches. At present the most active reclamation is in the Southeast Lowlands, but, as land becomes more valuable, the work must extend to the flood plains of the Missouri and its tributaries.

LUMBERING.

Although Missouri is not generally thought of as a timber state, in 1908 the state produced lumber to the value of over $8,000,000, or nearly 2 per cent of the value of lumber in the United States. Most of this supply comes from the Ozarks. The growing of merchantable timber is one of the most promising industries for the more dissected portions of the Ozarks (73a). As a recognition of the present and future importance of lumbering in the state, a department of forestry has recently been established at the State University.

MINING AND ASSOCIATED INDUSTRIES.

One might almost say that the history of Missouri began with lead mining, and the industry is still increasing in importance. We have before noted how the search for and mining of lead hastened the settlement of southeast Missouri. The importance of this industry in the state is recognized by the establishment and support at Rolla of the School of Mines.

Lead.—The old Mine la Motte in Madison County has yielded lead since 1720 and there are indications that the area was worked by Indians before that time. Since then the state has ranked high in the production of lead and, as regards this metal, is now the most productive state in the Union. In 1909 40 per cent of the lead of the United States, valued at over $12,000,000, was mined in Missouri. The southwestern district was opened by the discovery of lead in Jasper County in 1848 (39 d) and the district has developed rapidly.

The early mining was largely from open pits, although it was soon known that deposits lay deeper in the rocks. The open pits were soon worked out and abandoned. The diamond drill came into use in this state in the southeastern field in 1869 (39 e). By this means deep deposits were discovered with comparative ease. Another factor that has greatly increased production, both of lead and zinc, is the use of improved machinery by which low grade ores, like the disseminated ores, can be worked cheaply. The principal uses of lead in 1909 were oxides, mostly used for paints, 38 per cent; pipe, 15.2 per cent; shot, 2.4 per cent; sheet lead, 6.7 per cent.

Zinc.—The history of zinc mining in Missouri compared with that of lead is recent. Active production began in the seventies when mining and reducing machinery was fairly well developed and there was railroad transportation to market. The production rapidly increased and at present about 60 per cent of the total output of ore in the United States comes from Missouri. In 1909 the value of the zinc ore mined in the state was over $15,000,000. Comparatively little zinc is smelted in Missouri (12.7 per cent in 1909); much is smelted in Kansas and Oklahoma, where in 1909 about 60 per cent of the total zinc ore in the United States was smelted. The cheap gas of these states largely accounts for their important smelting industry. The principal uses of zinc in the United States (1909) and their percentage of use are: Galvanizing, 62.7; brass, 18.3; sheet zinc, 12.6.

Coal.—The extent of the coal fields in Missouri is shown in Figure 27. The beds lie approximately level and often outcrop in valleys where they are worked locally. Many farmers work these beds in the winter when farm work is slack. In 1908 Missouri produced one per cent of the total output of the United States. But a small fraction of the coal has been developed and coal lands commonly sell for their agricultural value only. The production is increasing at about the same rate as that of the United States. The value of the state's coal in 1909 was estimated at $6,591,000.

Iron.—The production of iron ore in Missouri at present is of relatively little importance. In 1908, about one-fourth of one per cent of the total production of ore is the United States was mined in Missouri. In 1880 the state produced 5 per cent of the ore production of the United States, but, as has been noted, the production rapidly declined with the partial exhaustion of the high grade ore of the Iron Mountain region. There is considerable good ore in the state, the mining of which must some time become an important industry.

Barite.—This is a heavy white mineral that is pulverized and used mainly as a pigment. Three-eighths of the total production of the United States in 1909 was obtained from Washington County with a value of about $100,000. Copper ore is mined in Fredericktown, Madison County. The glass sands of Missouri are easily mined and shipped eastward. Cheap coal and glass sand, together with good markets, have concentrated important glass plants at Crystal City and St. Louis.

MANUFACTURES.

The manufactures of Missouri have grown because of the market, facilities for transportation, power and raw materials. Central and eastern Missouri had their development accelerated by the river routes accessible to them and we have noted the importance of these factors in preceding paragraphs. With the growth of competing railroads the river traffic has declined to almost nothing. Recently railroads have been unable to handle freights quickly, railroad rates have risen and there is little doubt that a part at least of the river traffic will be resumed. The Missouri, like all graded rivers, has a shifting, shallow current which will require special boats and well trained pilots.

Railroad construction in Missouri began actively in the sixties. The first principal railroads were determined in part, not by the productiveness of the area to be served, but by the lands which were available to be given as a bonus. The construction continued until the state is now well served except in portions of the Ozarks. Railroad building in the Mississippi Lowlands has been rapid and this region is one of the most thoroughly served areas in the state. The level surface and narrow streams make construction easy in this region. The state in 1908 had 11.67 miles of railroad for each 100 square miles. In the same year the United States had 7.87 square miles.

The principal streams of Missouri are graded and do not therefore give the fall necessary for the best water power. Many smaller streams in the Ozarks have sufficient fall and some are already harnessed for use. There is an enormous amount of energy in the rapid Missouri which is unavailable by present methods, but in the French days at Cape Girardeau they used current wheels to grind their grain. This is simply a sort of wind mill placed on a raft and run by the current. It is suggestive of future possibilities along our graded rivers. There is abundance of bituminous coal in North Missouri with only a small fraction utilized.

The principal industries, as would be expected in a great agricultural state, are connected with the manufacture of meat and grain products. The rank of industries in Missouri in 1905 was: First, meat, packing and slaughtering; second, flour and gristmill products; third, tobacco; fourth, malt liquors; fifth, boots and shoes; sixth, printing and publishing; seventh, foundry and machine shop products; eighth, bakery products; ninth, lumber products; tenth, men's clothing.

The early directories of St. Louis and Kansas City show that meat packing establishments and grist mills existed from the earliest settlements. The center of the meat packing industry has migrated westward from Cincinnati until it is in the north central Mississippi Basin. In 1900 Missouri's rank in meat products was seventh in capital invested and sixth in value of products; the state ranked sixth in capital invested in the manufacture of gristmill products.

Clay Products and Cement.—Both of these industries have increased enormously during the last twenty years. The cheapness of production, the growing scarcity of lumber for which they are a partial substitute, and the variety of uses for which these products can be employed are among the causes for the rapid increase in their production. The raw materials for cement and clay products are widespread, although the production of both is contingent on cheap fuel; markets, transportation and labor are perhaps more important, therefore, in these than in many other industries.

Brick, tile and pottery are the leading clay products. Clay for brick and tile is abundant in every county and fuel in the coal fields is easily accessible. In 1909 the state ranked seventh in clay products with an output of over 4 per cent of that of the United States. For each person in Missouri in the same year there was produced approximately two dollars' worth of clay products.

Portland cement is made by heating pulverized shale and limestone in the proper proportion nearly to fusion. Its rapid development in the state is shown by the fact that, starting with practically no production in 1900, Missouri produced in 1909 over 5 per cent of the total output of the United States. Four plants in 1909 produced cement valued at nearly $3,000,000. The great plants along the Mississippi near Hannibal are a partial response to the upfold of an anticline which has brought up limestone and shale where they can be conveniently quarried.

But the great bulk of Missouri's manufactories are devoted to supplying a portion of the many articles of food, clothing, implements, etc., used by a large and productive population. Manufacturers are not mobile and lag behind the growth of population. This is brought out in the map (Figue 55), which shows the center of manufactories in 1900 to be in Ohio. Ohio was formerly an agricultural state, but possessed potential reserves of coal that are now being utilized until it is now one of the important manufacturing states.

It is safe to predict that Missouri will, like Ohio, become more and more a manufacturing state. Good home markets, transportation facilities with abundant coal point to an increase in manufactures. With this, as in other cases, agriculture will become more intensive, population more dense and farms smaller.

BIBLIOGRAPHY.

Starred (*) publications are easily available. Where possible, the price is given for available publications.

CLIMATE.

1 Daily weather maps will usually be sent to teachers for school purposes on application to the nearest station of the U. S. Weather Bureau. The following can be obtained from the Sta-

tion Director, U. S. Weather Bureau, Columbia, Mo.:
2 Summary of Southwestern Missouri, Section 49.
3 Summary of Southeastern Missouri, Section 50.
4 Summary or Northern Missouri, Section 58.
5 Later Spring Frosts in Relation to the Fruit Crop of Missouri.
6 Monthly reports and Annual Summaries of the Missouri Climatological Service.

DESCRIPTION AND TRAVEL.

7 Bek, L. C. Gazetteer of Missouri, 1823.
8 Cummings, Samuel. The Western Pilot, Cincinnati, 1837 (a, 76).§
9 Darby, William. Emigrant's Guide, New York, 1818 (a, 139).
10 Flint, Timothy. Recollections of the Last Ten Years in the Valley of the Mississippi, Boston, 1826 (a, 232), (b, 103).
11 Flint, Timothy. History and Geography of the Mississippi Valley, Cincinnati, 1832, Second Edition (a, 309), (b, 304), (c, 309), (d, 288).
12 Hall, James. Notes on Western States, Philadelphia, 1838 (a, 70).
13 Pittman, Philip. The Present State of the European Settlements on the Mississippi, London, 1770. Reprinted by Arthur H. Clark Co., Cleveland, Ohio, 1896 (a, 95-6).
14 Stoddard, Amos. Sketches of Louisiana, Philadelphia, 1912 (a, 216), (b, 209).
15 Welmore, Alphonso. Gazetteer of Missouri, St. Louis, 1837 (a, 151), (b, 107).
16 Williams, Walter (Editor). The State of Missouri, 1904. A somewhat detailed description of the state, published for the Louisiana Purchase Exposition (a, 68).

GEOLOGY.

The publications of the United States Geological Survey include Topographic Maps, Annual Reports, Monographs, Professional Papers, Bulletins, Water Supply and Irrigation Papers, Mineral Resources and Folios. Orders sent to the U. S. Geological Survey, Washington, D. C., should be accompanied by remittance in cash or money order. When out of stock they can usually be obtained from the Superintendent of Documents, Washington, D. C. They can often be obtained from one's Congressman. Where no price is given they are for free distribution so long as they last. Most of the publications of the Geological Survey of Missouri are out of stock, but are widely distributed over the state and are usually to be found in public libraries. Orders for the available reports should be sent to the State Geologist, Rolla, Mo. In the references on areal reports the following abbreviations will be used: U. S. G. S. for United States Geological Survey; Mo. Geol. Surv. for Missouri Geological Survey.

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§ Indicates a page reference.

17 Topographic maps. A part of Missouri has been mapped and a circular will be sent by the U. S. G. S. to those interested, showing the areas mapped. The maps are sent post free at 5c each or $3.00 per hundred.

18 Vols. 4 and 5, Mo. Geol. Surv., Paleontology of Missouri. Vol. 4 includes a readable description of the general geology of the state.

19 Vol. 8, Mo. Geol. Surv. contains (a) Crystalline Rocks of Missouri, by Erasmus Haworth; (b) Dictionary of Altitudes by C. F. Marbut; (c) Characteristics of the Ozark Mountains by C. R. Keyes; (d) Coal Measures of Missouri by G. C. Broadhead.

20 Vol. 9, Mo. Geol. Surv., 1896, contains reports on (a) The Higginsville Sheet, Lafayette Co., by Arthur Winslow; (b) Bevier Sheet, parts of Macon, Randolph and Chariton Counties by C. H. Gordon; (c) Iron Mountain Sheet; (d) Mine La Motte Sheet, parts of Iron, St. Francois and Ste. Genevieve Counties, by C. R. Keyes.

21 Vol. 12, Mo. Geol. Surv., 1898, contains (a) Geology of Greene Co. by E. M. Shepard, an excellent study; (b) Report on the Clinton Sheet (Henry Co.); (c) Report on the Calhoun Sheet (Henry and Benton Counties); (d) Report on the Lexington Sheet (Lafayette and Ray Counties); (e) Report on the Richmond Sheet (Ray and Carroll Counties); (f) Report on the Huntsville Sheet (Randolph, Howard and Chariton Counties). These reports are especially interesting in their descriptions of coal and coal measures.

22 *Joplin, Mo, Folio No. 148, U. S. G. S. Describes the geology of the southwestern mining region and gives a brief description of the Ozarks, 25c.

23 *Fayetteville, Ark. Folio No. 119, U. S. G. S. Includes a good description of the Boston Mountains.

24 *Geology of Miller County, Mo. Geol. Surv., 1900, by E. R. Buckley, A. F. Smith and S. H. Ball, 25c.

25 *Geology of Moniteau County, Mo. Geol. Surv., 1905, by F. B. Van Horne, 10c.

26 *Geology of Morgan County, Mo. Geol. Surv., 1908, by C. F. Marbut, 15c.

27 *Geology of Pike County, Mo. Geol. Surv., by R. R. Rowley, 15c.

28 *Bulletin 438, U. S. G. S., Geology and Mineral Resources of the St. Louis Quadrangle, by N. M. Fenneman.

29 *Geological Map of Missouri, Mo. Geol. Surv., 10c.

ECONOMIC GEOLOGY.

30 *Lime and Cement Resources of Missouri, by H. A. Buehler, Mo. Geol. Surv., 1907, 25c.

31 Clay Deposits in Missouri, by H. A. Wheeler, Mo. Geol. Surv., 1896, Vol. II. Properties, uses and distribution of clays.

32 *Cement Materials and Industry of the United States, U. S. G. S., Bulletin 243, 1905, 65c.

33 Preliminary Report on the Coal of Missouri, by Arthur Winslow, Mo. Geol. Surv., 1891. Describes the occurrence of coal beds.

34 The United States Geological Survey has in preparation a description of the coal fields of Missouri. It will be issued in the near future.

35 *Copper Deposits of Missouri, by H. F. Bain and E. O. Ulrich, U. S. G. S., 1905, Bulletin 267.

36a Report on Iron Ores, by F. L. Nason, Mo. Geol. Surv., 1892, Vol. 2. Includes prospects in many counties and a history of iron mining in Missouri.

36b *Iron Ores off Missouri, by G. W. Crane, Mo. Bureau of Geology and Mines, Vol. 10, Second Series, 1912. A later description of the ores and their occurrences. Sent to those interested on receipt of postage.

37 *The Disseminated Lead Ores of Southeast Missouri, by Arthur Winslow, U. S. G. S., 1896, Bulletin 132.

38 *Geology of the Disseminated Lead Deposits of St. Francois and Washington Counties. Part 1, text: Part 2, maps. By E. R. Buckley, 1909, Mo. Geol. Surv. (a, Part 2, plate 55).

39 Vols. 6 and 7, Mo. Geol. Surv., Lead and Zinc of Missouri, by Arthur Winslow, 1894. Vol. 6 contains a general history of the world's lead and zinc development and a somewhat detailed history of the development in the state. (a, 268); (b, 281); (c, 290); (d, 285); (e, 292).

40 Vol. 7 gives the occurrence and geology of the State's lead and zinc prospects up to the time of publication (a, 615).

41 *22nd Annual Report, U. S. G. S. Part 2, Preliminary Report on the Lead and Zinc Deposits of the Ozark Regions, by H. F. Bain, C. R. Van Hise and G. I. Adams, $2.25. Contains an interesting description of the physiographic features of the entire Ozark region. Part 3, $2.00, includes a report on "The Western Coal Field," by H. F. Bain. The Missouri coal field is included.

42 *Geology of the Granby Area by E. R. Buckley and H. A. Buehler, Mo., Geol. Surv., 1906. Describes the Granby zinc fields, 25c.

43 *Mineral Resources of the United States, U. S. G. S. Includes statistics of Missouri. Published annually and sent on request.

44 *Report of the Missouri Bureau of Mines, Jefferson City, Mo. A general view of the state's mining industry.

PHYSIOGRAPHY.

45 Vol. 10, Mo. Geol. Surv., 1896. (a) Physical Features of Missouri, by C. F. Marbut. An excellent summary of the main physiographic features of the state and their origin (a, 41-44); (b, plate 2). (b) Formations of Quaternary Deposits, by James E. Todd. The principal summary of what is known of the drift and loess in Missouri. It is, however, somewhat fragmentary.

46 The Evolution of the Northern Part of the Lowlands of Southeast Missouri, by C. F. Marbut, University of Missouri Studies, Vol. 1, No. 3, 1902 (out of stock).

47 *The Physiography of the St. Louis Area, by N. M. Fenneman, Illinois Geological Survey Bulletin No. 12, Urbana, Ill. (sent for postage).

48 *The Illinois Glacial Lobe, by Frank Leverett, Monograph No. 38, U. S. G. S. ($1.60). Although treating especially of Illinois, there is some discussion of Kansan drift in Missouri.

See also Numbers 19, 22, 23, 41 and 73 of this bibliography.

RIVERS.

The following Water Supply and Irrigation Papers, U. S. G. S.:

49 No. 44, Profiles of Rivers, by Henry Gannett. Includes profiles and data for some Missouri rivers.

50 *No. 96, Destructive Floods in the United States in 1903, by E. C. Murphy. Describes the Missouri flood for that year.

51 *No. 99, Stream Measurements in 1903. Included some Missouri rivers.

52 *No. 110, Contributions to the Hydrology of the Eastern United States, 1905. Includes portions of the Ozarks.

UNDERGROUND WATERS.

53 *No. 195, Underground Waters of Missouri, by E. M. Shepherd, 1907.

GEOGRAPHY.

54 The State of Missouri, by C. F. Marbut, Journal of School Geography, Vol. 1, April, 1897.

55 Geographic Influences in the Development of St. Louis, by Ellen C. Semple, Journal of Geography, Vol 3, 1904.

HISTORY.

56 Bek, Wm. G. The German Settlement Society of Philadelphia

and Its Colony at Hermann, Missouri, Americana Germanica Press, Philadelphia. 1907 ($1.50).

57 Case, T. S. History of Kansas City, 1888 (a, 46); (b, 57).

58 *Chittenden, Hiram M. The American Fur Trade of the Far West, three volumes, New York, 1902 (a, Vol. 2, 52); (b, Vol. 2, 501).

59 Chittenden, Hiram M. Early Steamboat Navigation on the Missouri River, New York, 1903 (a, 133).

60 Dana, C. W. The Great West, Philadelphia, 1857 (a, 163).

61 Edwards, Richard. Great West, St. Louis, 1860 (a, 391).

62 *Houck, Louis. History of Missouri, three volumes, Chicago, 1908 (a, Vol. 1, 44); (b, Vol. 1, 367); (c, Vol. 1, 375); (d, Vol. 3, 187); (1, Vol. 2, 104-05); (f, Vol 2, 188); (g, Vol 1, 351); (h, Vol. 2, 2); (i, Vol. 1, 377).

63 *Inman, Henry. The Old Santa Fe Trail, Topeka, 1889 (a, 143), (b, 45).

64 Miller, W. H. History of Kansas City, 1881 (a, 24).

65 * Million, John W. State Aids to Railroads in Missouri, University of Chicago Press, 1806 (a, 53).

66 Monette, John W. History of the Valley of the Mississippi. 2 vols., 1846 (a, Vol. 1, 554).

67 Scharf, J. Thomas. History of St. Louis City and County, 2 vols., Philadelphia, 1883 (a, Vol. 1, 86).

68 Spaulding, C. C. Annals of the City of Kansas City, Kansas City, 1858 (a, 22-3).

69* Stevens, W. B. History of St. Louis. 1909 (a, 181).

70 Switzler, W. F. History of Missouri, St. Louis, 1879 (a, 197); (b, 193).

71 Report on the Internal Commerce of the United States, Part 2, 1889. 50th Congress, 1st Session, Document 6 (a, 88); (b, 40); (c, 89); (d, 58).

72 *Winson, Justin. The Mississippi Basin, Boston and New York, 1895 (a, 462).

SOILS.

73 Soils of the Ozark Region, by C. F. Marbut, Research Bulletin No. 3, College of Agriculture, University of Missouri 1910. An interesting and useful monograph. It describes the geology, topography, soils and geographic responses in the Missouri Ozarks. At present it is, unfortunately, out of stock (a, 263).

74 *The Soil Survey Reports of the different counties in Missouri contain much interesting matter available for school work. At present the following areas have been described and new areas are being surveyed each year: Putnam Co., Scotland Co.,

Shelby Co., Crawford Co., Webster Co., Howell Co., Saline Co., Sullivan Co., O'Fallon Area (part of St. Louis and St. Charles Counties), Audrain Co., Cape Girardeau Co., DeKalb Co., Marion Co. The following areas have been surveyed and the reports will soon be available: Pemiscot Co., Macon Co., Platte Co. The reports, so long as they last, are sent free upon application to the Bureau of Soils, Washington, D. C. Frequently one's Congressman can supply copies from his quota if they cannot be obtained from the Bureau of Soils.

75 *Soils of the United States, by Milton Whitney, Bulletin 55, Bureau of Soils, Washington, D. C., is very useful.

STATISTICS.

76 *Report of the Bureau of Labor Statistics, Jefferson City, Mo. Published annually and sent on request.

77 *Statistical Abstract of the United States, Bureau of Statistics, Department of Commerce and Labor, Washington, D. C. Published annually and sent on request.

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EDUCATION SERIES 5

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ARTHUR H. R. FAIRCHILD
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"No one can convey a good character to another. Every one must make his character for himself. All that one man can do to make another better is to remove obstacles, and supply conditions favorable to the formation of a good character."—*T. H. Greene.*

"In the task of education, perhaps as much as in any department of civic life, we need a reminder that there are certain ideals of character, certain paramount ends of conduct, which should underlie and determine all our efforts. We are tempted, perhaps, to fix our eyes on the machinery of education, on the subjects of instruction, on the direct mercantile results of our system, on our immediate ends as the teachers of this or that branch of knowledge."—*S. H. Butcher.*

"You might read all the books in the British Museum (if you could live long enough) and remain an utterly 'illiterate', uneducated person; but if you read ten pages of a good book, letter by letter,—that is to say, with real accuracy,—you are forevermore in some measure an educated person. The entire difference between education and noneducation (as regards the merely intellectual part of it) consists in this accuracy." —*Ruskin.*

"At school I enjoyed the inestimable advantage of a very sensible though at the same time a very severe master. . . . At the same time that we were studying the Greek tragic poets, he made us read Shakespeare and Milton as lessons: and they were lessons, too, which required most time and trouble to 'bring up', so as to escape his censure. I learned from him that poetry, even that of the loftiest and, seemingly, that of the wildest odes, had a logic of its own, as severe as that of science; and more difficult, because more subtle, more complex, and dependent upon more and more fugitive causes. 'In the truly great poets,' he would say, 'there is a reason assignable, not only for every word, but for the position of every word.' "—*Coleridge.*

"Of all our study the last end and aim should be to ascertain how a great writer or artist has served the life of man; to ascertain this, to bring home to ourselves as large a portion as may be of the gain wherewith he has enriched human life, and to render access to that store of wisdom, passion, and power, easier and surer for others. If our study does not directly or indirectly enrich the life of man, it is but a drawing of vanity with cart-ropes, a weariness to the flesh, or at best a busy idleness."—*Edward Dowden.*

The Teaching of Poetry in the High School

I. INTRODUCTORY

The Problem

Teaching poetry is everywhere essentially the same task. This side of the graduate school at least, the ends to be attained are much the same in all grades of work. Special problems at each of the chief stages there are, of course; but the task is everywhere much the same; the differences are differences of emphasis, range, and scope.

In order to get the problem of teaching poetry in the high school fairly before us, let us take Frederick Oakes Sylvester's poem on the Mississippi River, and ask what we should do with it had we to "teach" it in the high school. The poem follows:

> And do you love my river,
> My stream of the tawny tones,
> And do you find its world, indeed,
> The rarest beauty owns?
>
> Oh, I have seen it waken
> To welcome home the dawn,
> And I have seen its eyelids close
> When the veil of night is drawn!
>
> Yea, I have heard its laughter,
> Have seen its glorious smile,
> And I have felt it leap for joy
> And shout for joy the while.
>
> What speed on wind-swept courses,
> What races 'gainst the breeze!
> What secret pauses, songs and dreams
> Under the brooding trees!
>
> The hills clasp hands by its borders,
> The forests sing by its side,
> While the prairies that rival the ocean's realm
> Surge round it far and wide.

It is the blood of the vales and the valleys,
It is wine for flower and tree,
It is pulse of the plains, the meadows' veins
And the land's great artery.

I know you love my river—
God grant you know its worth;
For He made it fair beyond compare,
The king of the rivers of earth.[1]

If you had this poem for class study, what would you proceed to do? Would you, on completing the poem previously studied, "assign" this poem to be recited upon next day? If so, would you give out in advance some questions or suggest points for study? What kind of questions would you ask in the recitation period? Would you begin by reading the poem aloud to the class? Or would you have some member of the class read it? Would you begin somewhat as follows: "For today's lesson you were to be prepared on the poem, 'And do you love my river' "; then, reading the lines:

"And do you love my river,
My stream of the tawny tones,"

ask, "What river is referred to?" "What is the meaning of 'tawny tones'?"; following up these questions with others of like character?

Or, would you not "assign" the poem at all, but begin the study of it in class without having the students prepare upon it, without, indeed, their knowing even what they were going to read? If so, how would you begin? Would you say, "Today we are to read together a poem about the Mississippi River"; then read the opening lines? Or would you, without previous assignment, and before the pupils knew what poem was to be studied, ask such questions as these: "How many of you have ever seen the Mississippi River? If not, have you seen the Missouri River? What is the color of the water? Why? What are the shores like? Is its current swift or slow? Has it eddies? Is the River crooked or straight? Of what are the banks composed? Are there trees on the banks? Did you ever see the River at sunrise or sunset? What did it look like? Do you like to watch a river? What does it call up in your imagination? Does it make you wonder where it comes from, where it is going? Do you like to think of all the people who looked upon it in the years gone by? Do you like to think of all the many thousands who watch it now from day to day, and of all those who will do so in the years to come? Do you like to think of the homes, the towns, and the cities scattered along the River's banks? Did you ever 'love' a river?"[1]

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[1] Quoted by permission of the author.

Then, having asked some such questions, the number and character of them having been determined by the situation before you, would you turn to the poem with a view to bringing the pupils into something of the poet's attitude and feeling? And what would be your aim—to give instruction, verbal, geographical, moral; to afford immediate pleasure and be satisfied with that; or, without attempting to produce actual pleasure, to make the poem merely a means toward the general improvement of taste and understanding?

A score of other questions might be proposed. Would you tell the pupils about the author's life? How much would you think it necessary to know, if this were the only poem of his to be read? Would you comment on verse and stanzaic form? Would you ask whether the poem were epic, lyric, or dramatic, and whether the poet apparently spoke from experience at first hand, or from observation, or from report and hearsay merely? How often would you think it necessary actually to read the poem in class? Would you, for example, first read the poem through without comment; follow this reading with a critical study in which all difficult, unusual, or striking phrases were dwelt upon sympathetically; and this reading with another reading, unbroken by comment? Or would the one critical reading itself be sufficient? Would you have the pupils memorize the poem? If so, before or after the "recitation"? Would you, incidentally or otherwise, seek to bring home to them in any special way the value and importance

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1. Many of these questions are purposely so framed as to indicate the type of answer desired. Too many of them could be answered merely by "yes" or "no". For the type of questions more commonly to be employed in a class-exercise, see the practical work later.

of studying and reading poetry? For examination purposes, what type of question would you ask? Do you think it is possible in the study of poetry to ask altogether satisfactory questions? What do you regard as a proper test of the pupil's understanding and appreciation of a poem?

Such questions as these, and many others, might be asked. The answer to some of them is obvious. The use of certain questions would, of course, commit a teacher to some kind of general method;[1] the use of others would signify a definite conception of ends to be attained through the study of poetry in the high school.

Purpose of This Bulletin

Directly or by implication, it is the task of the writer to answer these and like questions. This bulletin has as its specific purpose to offer some practical aid to the teacher of poetry in the high school. There is no desire, much less attempt, to foist upon any one a final method of teaching poetry. The writer has no such method, knows of none, believes that none can be devised. He offers no novel theory, no compendium of infallible rules; he has none and knows none. Each class with its distinctive personality, each poem with its subtle shades of thought and emotion, each individual class-situation faced by the teacher from hour to hour, creates conditions too complex by far to be provided for by any set method. It is only through an adroit use of knowledge and experience, the expression of personality, consistent good sense, and ready sympathy and tact, that success in such situations can be won. He who depends upon a formal method of teaching poetry is lost. He who attempts to follow slavishly what he finds other people doing and saying, as they teach poetry, is worse than lost. The best things contributed to the class-study of any poem are the things that are never said. They lie in the "background" of the teacher's life. They come to the wondering pupil as glimpses of that "undiscovered country" which seems to be inhabited by inviting truth, fine ideals, and inspiriting action. Whoever teaches poetry with distinctive success has probably learned to do so chiefly through being well taught. Much he will have learned, too, through the actual experience of teaching and by observing successful teachers. He who has been well taught is indeed fortunate; for if he is successful he will have mastered the elements of his art without ever knowing how, when, or where. But, should any teacher not have this advantage, he may still learn much by at least one other means—by visiting the classes of a successful teacher and observing how he does his work.

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[1] Cf. Stevens's, *The Question as a Measure of Efficiency in Instruction*, published by Columbia University, New York, 1912.

As far as is practicable on paper, this bulletin proposes to offer such an opportunity. Work conducted by a successful teacher in the University High School[1] will be presented; and the general method, with its more important implications, will be discussed by the writer. In the teaching of poetry, more perhaps than in the teaching of any other subject, the personal factor looms large. In the high school it is the main factor. Methods are dead and hollow forms unless vitalized by personality. Much of this personal element must be lost, from the very nature of a bulletin; yet the bold outlines of the work can be seen; here and there helpful suggestions may be caught.

The Elements or Factors Involved

Before turning to the practical class-work, let us consider the elements or factors involved.

In teaching poetry, as in teaching other subjects, three elements or factors are involved: the teacher, the pupil, the subject-matter. Of these, the subject-matter is obviously the only one that distinctly marks off the problem from that of teaching any other subject; yet in teaching poetry there are special considerations affecting the teacher and the pupil which ought not to go unmentioned.

(1) *The Teacher:* Of the qualifications essential to the successful teacher of poetry, the books on pedagogy contain

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[1] This is an institution under the control of the School of Education of the University of Missouri. It is used for the practical training of teachers and for experimental work in the field of education.

reasonably satisfactory statements. It might here be emphasized, however, that for the teaching of poetry the primary qualification is a special talent which no artificial means can supply. That talent cannot be described, yet we know it when we find it. The secret of it seems to be imagination. He who possesses this talent instinctively puts himself in the pupil's place, catches his point of view, apprehends his difficulty, and uses the subject-matter in hand as the means of awakening and furthering his intellectual and emotional life. He thinks of the subject taught, not as something which the pupil is obliged by subtle devices of invitation and compulsion to master; but as a means, as rare as it is pleasurable, of stimulating, broadening, and uplifting a relatively undeveloped personality. He knows that to bring the minds of his pupils under the influence of beauty is to bring them, more effectively than by any other means possible, under the reign of law. Though he deliberately aims at arousing and cultivating feeling, he is free from sentimentalism, because he insists that feeling shall always be connected with worthy ideas. He has a religion and is moral-minded, but he hasn't a drop of missionary blood in his veins. He is the artist-teacher.

The possession of the special talent by which all this is chiefly effected is not all. In itself, it does not ensure the highest success. A sound knowledge of the subject, both in its intellectual and its emotional aspects, and an ardent love for it; some acquaintance with other fields for comparison; a good command of idiomatic English; a voice well toned and modulated—all are indispensable to the highest success in teaching poetry in the high school. No teacher seriously lacking in any of these qualifications should continue to teach, without taking immediate steps to overcome the deficiency. Special talent cannot be acquired, but training is largely a matter of application and industry.

(2) *The Pupil:* (a) *His General Importance:* Important as the teacher is, he is still secondary to the pupil. No conception is more essential for the teacher at this stage than that the pupil, not himself, not even the subject which he teaches, is the objective point of all his endeavor. From school board

and superintendent to humblest janitor, the entire organization exists for the sake of the pupil. For his benefit alone administrators and teachers are trained, buildings erected, textbooks written, methods of instruction devised. It is in order to free his mind from the bondage of a weak sensuousness, to effect through imagination an expansion of his inner life, to bring into full clearness his relation to the world, to prepare him to meet the needs of his time, and to deepen his capacity for enjoyment in its higher forms, and only for this reason, that we have made the pupil the center of this elaborate organization.

The pupil should never, of course, be made aware, much less told, of his importance. Egotism and impudence, intellectual flippancy and emotional perversion are the bitter fruits of error here. The pupil is important, not because of what he is and what he knows, but because of what he may become. Should he persistently refuse to submit himself to recognized means of developing his possibilities, he forfeits his right to the advantages of education and becomes an object for discipline.

Nor should the teacher err in attitude. To condemn a child for age, race, or previous condition of servitude is at once to break the bond. The pupil's training, his environment, his present lack of appreciation for poetry, may be cause for regret, yet the pupil as he is presents a challenge to the imaginative understanding, sympathy, and ability of the teacher. The immediate aims of the pupil, be they good or bad, high or low, depend entirely upon the *history of his inner life up to the present moment*. Between these aims and the poetry in hand, if only the poetry has been judiciously selected, there is always some connection possible, some point of attachment discoverable, some line of approach open. It is the teacher's task to discern this point of attachment, and to effect a union, in knowledge and ideals, between the pupil's aim and the content of the poem.

(b) *The Pupil and the High School Stage:* The high school is preceded by the grade school.[1] In the grade school a broad choice is made. As between a greater good, represented by his studies, and a lesser good, represented by play or whatever else diverts from study, the average grade pupil chooses the greater good. Of the sum-total of his time and energy, he is now willing, he unconsciously says, to devote a part, even the main part, to the pursuit of things of the mind. He is not the ''whining school-boy'' of the cynic Jacques, ''creeping like snail unwillingly to school,'' but often with joy and gladness, he goes to school, learns, studies.

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[1] Cf. Hyde's *The Teacher's Philosophy in and out of School.*

In the high school a further and perhaps more significant choice is made. From a wide range of subjects, the pupil now elects the particular one that most appeals to him. Not the broad choice between work and play, but the particular selection of some one thing to pursue and work upon, is made. The high school period is the period of self-discovery. Here it is that individuality is born. Personality now asserts itself, indicates its affinities. Life-interests are awakened; aptitudes discovered; preferences proclaimed. Taste becomes assertive; vocations are selected; life-plans are shaped. Not ''What does the pupil know?'' but ''What does he want?'' is now the important question. ''What one loves,'' says President Hyde, ''is more important than what one knows; what one wants to do, and is interested in trying to do, is of more consequence at this stage than what one has done.'' At the high school stage the pupil, and especially the pupil of more pronounced intellectual and emotional life, predestinates his career. Even the most stolid seldom, if ever, shakes entirely free from the subtle and quiet influences borne in upon his mind in this impressionable and formative period. In the high school period every pupil is faced toward his career; some are even started.[1]

(c) *Poetry and its Relation to the Pupil at the High School Stage:* In this process of selection and orientation which takes place in the high school, poetry plays an important part. Skillfully handled, no subject opens wider or more inviting oppor-

[1] That the end sought or the plans conceived by the pupil are now self-centered and inherently selfish, that it is *his* plans and *his* success that alone concern the pupil, need not disturb the moralist. The selfishness is as naïve as it is unconscious and undeliberated. The world, if not the college, will take care of that; in some measure at least it will *socialize* his aims. The important thing now is that the pupil shall find what he wants to do; that he shall discover a purpose in life.

tunities to the pupil. Poetry is a transcript of life. It is a representation of life, not only as it is, but as it may and ought to be. From poetry the pupil may not only gain a refined and elevated pleasure; he may also learn, not only what life is, but what he himself is. Ignorance, not so much of subjects as of ourselves, is the fruitful source of error and of tragic waste in life. "Know thyself" was the admonition over the temple at Delphi, and to this practical end the Greeks themselves used poetry. To the same end the high school pupil may use poetry. Through it he may come to some measure of self-knowledge. Aptitudes unknown because unrevealed; affinities too deep to be otherwise suspected; tendencies too secretly bestowed to have been hitherto recognized, will, through the revealing power of the skillful teacher, gradually unfold themselves to the wondering and admiring mind of the pupil. "Is that what it means?" "Is life like that?" "Are there really such people?" "There is a character just like me!" "I like that little poem"—almost day by day, in class or out, these and like expressions escape his lips. Poetry will help the high school pupil to discover his real self, to recognize his strength and discover his weaknesses. It will aid him in his choice of life-work, enable him to adapt himself to it, and give him a body of propelling and inspiring ideals that will help him to achieve the truest success.

(3) *The Poetry:* The third element or factor is the subject-matter, the poetry. This is not the time to discuss this subject even in a general way.[1] One or two observations affecting our present purposes may, however, be made.

In order to teach anything, one should know what that thing is. In order to teach algebra, or physics, or geography, successfully, one must know what the subject-matter consists of, what its limits are, its principles. And in teaching poetry it would appear to be an obvious requirement that we know what poetry is, that we be able to define it. But a serious difficulty arises here. One can define the subjects just named, but poetry falls into a different class. Poetry cannot be satisfactorily defined. From no definition yet framed, has any one ever gained an exact notion of what the essential nature of poetry is. The teacher of poetry, accordingly, finds himself in the anomalous position of having to deal with a subject of indefinite nature, with no apparent fixed limits, and no clearly established principles. Small wonder if he is bewildered by the range of his task! Yet, the true teacher of poetry does not complain about limitations; he rejoices in the range of his opportunities. His subject is not restricted as most subjects are; it touches life at many points, views it from many angles. And he gives token of his feeling by his manner of dealing with his subject-matter. If he cannot always point to a principle or a law to justify what he says and does, he knows that he can vindicate himself by results which are real, however intangible and secretly bestowed. He knows that he adds to the enjoyment of life, makes it sweeter, more wholesome, more endurable. In the teaching of poetry the character and range of the subject-matter offer peculiar difficulties, but these difficulties also represent rare opportunities for one who knows how to use them.

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[1] See the writer's *The Making of Poetry*, Putnam's, 1912.

One distinction, however, will be of immediate help. This is the distinction between *fact* and *value*. If I say, "There is a tree", or, "There is a man", I state a fact. If I say, "There is a beautiful tree", or, "That was a noble act", I indicate a value. This distinction between fact and value is of cardinal importance in the teaching of poetry; none is greater. Indeed, I do not hesitate to say that *all successful teaching of poetry in high school depends finally upon a recognition of the relative importance, in any poem, of these two elements, and upon the emphasis put upon them.*

Let me illustrate briefly. In the poem which I have quoted, there are certain matters of fact stated or implied. Is it a fact, for instance, that the Mississippi is a river of "tawny tones"? Are there "wind-swept courses", "races 'gainst the breeze", "secret pauses . . . under the brooding trees"? Do "the hills clasp hands by its borders", "the forests sing by its side", the prairies "surge round it far and wide"? Is it "blood of the vales and the valleys", "wine for flower and tree", "pulse of the plains, the meadows' veins And the land's great artery"?

These are indeed all matters of fact. Figuratively expressed, they can nevertheless be geographically confirmed; and no one can be said to have an intelligent understanding of the poem who has not mastered these matters of fact. But merely to master these facts, however thoroughly, is of course not to know the poem in its true sense. The poem has an element of value which is something more than the sum-total of its apprehended difficulties. This value can be known *only in and through feeling.* It cannot be stated, cannot be described. We speak of this experience as appreciating or enjoying the poem, and though that may mean different things to different people, it is none the less real. Here it is something of a renewed or an awakened love for the great River. After one has understood the language of the poem, and become master of the facts, one ought to enter into something of the writer's feeling for the River. One must needs do so if one dwell sympathetically upon the poem. To find this joy of love for a great river, to make that love bear a close and vital relation to one's life, is to come into possession of something of the ''value'' of this poem. Poetry must rest upon fact, must in general be true to it and conform to it; but, in common with the other arts, it has as its great social function to unfold and reveal the permanent, significant, and indefectible "values" of life. The ''value'' element in a poem always represents that for which the poem was really written; all elements of fact, however novel, significant, or important they may be in themselves, are justifiable in a poem only through the ''value'' which they help to reveal. ''To know is good. To feel is better,'' says Mr. Bliss Perry, ''when it is a question of appropriating the form and meaning of a work of art.''

An element of fact, and an element of value: herein lies the content of all poetry; herein lie the problems of the teaching of poetry! To drill on facts alone in teaching poetry, while it will doubtless make for habits of accuracy and precision, is to kill the appreciation and enjoyment of poetry.[1] It is to get the letter and destroy the spirit. On the other hand, to ignore the facts and unduly emphasize the feeling or value element in poetry is to engender habits of slovenliness and inaccuracy and to throw the whole pursuit of poetry into an atmosphere of dilettantism and sentimentalism.

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[1] Visiting a high school class, on one occasion, where they were studying *Henry V.*, the writer ventured to ask the class why they studied poetry. The brightest boy in the class, after a little reflection. made the interesting reply, ''To get a knowledge of history''. The answer was a definite indication of the teacher's method.

II. SOME PRACTICAL WORK

With these suggestions before us, we may turn to some practical work carried out in the High School connected with the School of Education in the University of Missouri.

The poet selected was Robert Browning. The difficulties which beset the study of this author may perhaps not unfairly be regarded as a representative test of what may be accomplished under the method employed. The class was a senior class and had for some time been studying *Browning's Shorter Poems*, published by the Macmillan Company. The poems were studied, not in the order in which they are printed in the text, but, as seems more advisable for younger students especially, according to the feelings, the ideas, and the conceptions revealed by the poems. Poems had been classified and read as follows: (I) Narrative Poems: *The Pied Piper of Hamelin; "How They Brought the Good News from Ghent to Aix"; Hervé Riel; Incident of the French Camp;* (II) Patriotic Poems: *Cavalier Tunes; Home-Thoughts, from the Sea; Home Thoughts, from Abroad;* (III) Poems Dealing with Italy: *The Italian in England; Up at a Villa—Down in the City; Love Among the Ruins; "De Gustibus—";* (IV) Personal: *My Star; Summum Bonum; Why I am a Liberal; The Lost Leader; Prospice; Epilogue to "Asolando";* (V) Philosophical and Ethical: *My Last Duchess; "Childe Roland to the Dark Tower came"; Rabbi Ben Ezra; Saul; Songs from "Pippa Passes."*

The next poem to be read was *Andrea del Sarto.* No previous assignment had been made, and the pupils came to class not knowing what poem would next be read. When the class was ready to begin, a stenographer came in and took the report which follows.[1]

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[1] This report has throughout been revised and edited by the writer. The purpose of this revision and editing has consistently been to bring out more clearly the method and aims involved in the actual teaching. Quite possibly some things have been eliminated and changed which a teacher experienced in high school work would have left; yet the background of the study, which is here the essential thing, seems clear and evident. The importance of personality and those other qualities of character which inspire pupils in the teaching of poetry in the high school can scarcely be overemphasized; and yet it is entirely possible that a teacher with such qualifica-

T. Last day we finished reading together the *Songs from "Pippa Passes"*. Before we finally leave them, suppose you remind us who Pippa was and how she came to sing those songs.[1]

P. Pippa was a little silk-winder in the silk mills of Asolo. She is one of the most charming of Browning's characters that we have read about. As she passed in and out of the village on the one holiday of the year that she has, New Year's Day, she sang the songs that we read and, without knowing it, through them influenced the lives of people about her. The song which begins:

"The year's at the spring
And day's at the morn:"

awakened two wicked people to a sense of their guilt and of the divine government of the world. *Pippa Passes* is a drama, but from what you read us about it, not a drama like *Julius Cæsar*. It gives a series of scenes, each of which represents a crisis in someone's life. Pippa sings her songs as she passes, but she does not know of the deep influence that they have upon the lives of people about her.

T. Yes. Very good. Today we shall begin to read together another poem; but before we do so there are some interesting things we ought to know. Do you remember that, when we studied the life of Browning,[2] we mentioned John Kenyon?

P. Yes.

T. Who was he?

P. A friend of the Brownings.

T. That is right. Yes?[3]

P. Kenyon died in 1855 and left the Brownings a lot of money—£11,000—just when they needed it.

T. I am glad you remembered that. You will remember, too, that we often spoke of Florence. What is it?

P. A city in Italy.

T. That is correct. Will you please point it out for us on the map?[4] (Student points it out on the map.)

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tions may do little more, finally, than stir her pupils into a state of emotional froth. All teaching of poetry that is ultimately effective, that leaves its permanent impressions, must have a background of ideas, aims, and conceptions. These ideas, aims, and conceptions can never be satisfactorily stated, but they can be implied and suggested by such an exercise as that which is here given. It was with this fact in mind that the writer eliminated some non-significant things and changed others in the class-report.

[1] The names of students called upon have been omitted in the report. The teacher explained that she consistently addressed all comprehensive questions first to the class as a whole, and then referred them to some particular student. To name a student before asking a question is often to lose at once much of the possible interest of the other members of the class. It should further be mentioned that incorrect answers, especially in the latter part of the report, have been eliminated as having no particular significance in this exercise. The absence of these answers, as well as the omission of the usual courtesies of replies by the students, need give no erroneous impression.

[2] This had been done after the students had become interested in Browning, especially in connection with "Poems Dealing with Italy."

[3] In response, as frequently, to another student who volunteered an answer.

[4] It is well to have a map by for ready reference. Names of places mean little unless they are localized.

T. For what, did we find, is this city now chiefly famous?

P. For its art. There are many fine paintings and buildings there.

T. That is right. One of the most famous buildings in Florence is the Pitti Palace (teacher writes name on board); and one of the best known paintings in the Pitti Palace is a portrait of a painter, Andrea del Sarto, and his wife. This print which I have here is a copy of the painting (teacher shows print to class)[1].

An interesting story is connected with this painting. Kenyon asked Browning to buy him a copy of the portrait. None was to be had; so Browning wrote a poem, putting into it just what the painting had meant to him, and sent it to Kenyon. This poem is known as *Andrea del Sarto,* and is the next one that we shall read together. In writing this poem, Browning did not, however, depend solely upon his impressions from the painting. He made use of a book which is known as Vasari's *Lives of the Painters.* (Teacher writes name and title on the board.) Vasari has told in some detail the story of Andrea del Sarto and his wife. In writing his poem Browning has followed his account very closely. If you will listen attentively, I shall be glad to read to you some of the more important parts of the story as Vasari[2] tells it. (Teacher reads.)

> "At length then we have come, after having written the lives of many artists who have been distinguished, some for colouring, some for design, and some for invention; we have come, I say, to that of the truly excellent Andrea del Sarto, in whom art and nature combined to show all that may be done in painting, when design, colouring, and invention unite in one and the same person. Had this master possessed a somewhat bolder and more elevated mind, had he been as much distinguished for higher qualifications as he was for genius and depth of judgment in the art he practised, he would beyond all doubt, have been without an equal. But there was a certain timidity of mind, a sort of diffidence and want of force in his nature, which rendered it impossible that those evidences of ardour and animation, which are proper to the more exalted character, should ever appear to him; nor did he at any time display one particle of that elevation which, could it but have been added to the advantages wherewith he was endowed, would have rendered him a truly divine painter: wherefore the works of Andrea are wanting in those ornaments of grandeur, richness, and force, which appear so conspicuously in those of many other masters. His figures are nevertheless well drawn, they are entirely free from errors, and perfect in all their proportions, and are for the most part simple and chaste."

Vasari, after describing various paintings by Andrea, proceeds:

> "These various labours secured so great a name for Andrea in his native city, that among the many artists, old and young, who were then painting, he was accounted one of the best that handled pencil and colours. Our artist then found himself to be not only honored and admired, but also in a condition notwithstanding the really mean

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[1] See frontispiece.

[2] Some parts follow the first edition.

price that he accepted for his labours, which permitted him to render assistance to his family, while he still remained unoppressed for his own part, by those cares and anxieties which beset those who are compelled to live in poverty. . . .

"At that time there was a most beautiful girl in the Via di San Gallo, who was married to a cap-maker, and who, though born of a poor and vicious father, carried about her as much pride and haughtiness as beauty and fascination. She delighted in trapping the hearts of men, and among others ensnared the unlucky Andrea, whose immoderate love for her soon caused him to neglect the studies demanded by his art, and in great measure to discontinue the assistance which he had given to his parents.

"Now it chanced that a sudden and grievous illness seized the husband of this woman, who rose no more from his bed, but died thereon. Without taking counsel of his friends therefore; without regard to the dignity of his art or the consideration due to his genius, and to the eminence he had attained with so much labour; without a word, in short, to any of his kindred, Andrea took this Lucrezia di Baccio del Fede, such was the name of the woman, to be his wife; her beauty appearing to him to merit thus much at his hands, and his love for her having more influence over him than the glory and honour towards which he had begun to make such hopeful advances. But when this news became known in Florence, the respect and affection which his friends had previously borne to Andrea changed to contempt and disgust, since it appeared to them that the darkness of this disgrace had obscured for a time all the glory and renown attained by his talents.

"But he destroyed his own peace as well as estranged his friends by this act, seeing that he soon became jealous, and found that he had besides fallen into the hands of an artful woman, who made him do as she pleased in all things. He abandoned his own poor father and mother, for example, and adopted the father and sisters of his wife in their stead; insomuch that all who knew the facts, mourned over him, and he soon began to be as much avoided as he had previously been sought after. His disciples still remained with him, it is true, in the hope of learning something useful, yet there was not one of them, great or small, who was not maltreated by his wife, both by evil words and despiteful actions: none could escape her blows, but although Andrea lived in the midst of all that torment, he yet accounted it a high pleasure."

In speaking of one of Andrea's paintings, Vasari says:

"Beneath this group are two figures kneeling, one of whom, a Magdalen with most beautiful draperies, is the portrait of Andrea's wife, indeed he rarely painted the countenance of a woman in any place that he did not avail himself of the features of his wife; and if at any time he took his model from any other face, there was always a resemblance to hers in the painting, not only because he had this woman constantly before him and depicted her so frequently, but also, and what is still more, because he had her lineaments engraven on his heart; it thus happens that almost all his female heads have a certain something which recalls that of his wife. . . .

"While Andrea was thus labouring over these works in Florence, poorly remunerated for his toils, living in wretched poverty and wholly incapable of raising himself from his depressed condition, the two pictures which he had sent into France were obtaining much admiration from King Francis, and among the many others which had been despatched to him from Rome, Venice, and Lombardy, these had been adjudged to be by far the best. That monarch, therefore, praising them very highly, was told that he might easily prevail on Andrea to visit France, when he might enter the service of His Majesty; this proposal was exceedingly agreeable to the king, who therefore gave orders that everything needful should be done for that purpose, and that a sum of money for the expenses of the journey should be paid to Andrea in Florence. The latter gladly set forth on his way to France accordingly, taking with him his scholar Andrea Sguazzella.

"Having in due time arrived at the French court, they were received by the monarch very amicably and with many favours, even the first day of his arrival was marked to Andrea by proofs of that magnanimous sovereign's liberality and courtesy, since he at once received not only a present of money, but the added gift of very rich and honorable vestments. He soon afterwards commenced his labours, rendering himself so acceptable to the king as well as to the whole court, and receiving so many proofs of good-will from all, that his departure from his native country soon appeared to our artist to have conducted him from the extreme of wretchedness to the summit of felicity. . . .

"One day he received a letter, after having had many others, from Lucrezia his wife, whom he had left disconsolate for his departure, although she wanted for nothing. Andrea had even ordered a house to be built for them behind the Nunziata, giving her hopes that he might return at any moment; yet as she could not give money to her kindred and connections, as she had previously done, she wrote with bitter complaints to Andrea, declaring that she never ceased to weep, and was in perpetual affliction at his absence; dressing all this up with sweet words, well calculated to move the heart of the luckless man, who loved her but too well, she drove the poor soul half out of his wits; above all, when he read her assurance that if he did not return speedily, he would certainly find her dead. Moved by all this, he resolved to resume his chain, and preferred a life of wretchedness with her to the ease around him, and to all the glory which his art must have secured to him. He was then too so richly provided with handsome vestments by the liberality of the king and his nobles, and found himself so magnificently arrayed, that every hour seemed a thousand years to him, until he could go to show himself in his bravery to his beautiful wife. Taking the money which the king confided to him for the purchase of pictures, statues, and other fine things, he set off, therefore, having first sworn on the gospels to return in a few months. Arrived happily in Florence, he lived joyously with his wife for some time, making large presents to her father and sisters, but doing nothing for his own parents, whom he would not even see, and who, at the end of a certain period, ended their lives in great poverty and misery. . . .

"He was nevertheless determined to return to France, but the prayers and tears of his wife had more power than his own necessities, or the faith which he had pledged to the king; he remained therefore in Florence, and the French monarch was so greatly angered thereby, that for a long time after he would not look at the paintings of Florentine masters, and declared that if Andrea ever fell into his hands he would have no regard whatever to the distinction of his endowments, but would do him more harm than he had before done him good. Andrea del Sarto remained in Florence, therefore, as we have said, and from a highly eminent position he sank to the very lowest, procuring a livelihood and passing his time as he best might."

It is interesting to note that Vasari was at one time Andrea's pupil, and that he published his *Lives of the Painters* while Andrea's widow was still in Florence. Recent investigation has failed to produce any evidence whatever in support of the charge of embezzlement made by Vasari against Andrea. The charge is now generally discredited. We are now ready to begin reading together Browning's poem, *Andrea del Sarto*. Please open your book at page 149. First, tell me something about the title.

P. It's a man's name.

T. What nationality do you know this man to be?

P. Italian.

T. Now what do you think Andrea might mean in English?—Is there an English name which this name suggests to you?

P. Andrew.[1]

T. Yes. Very good. Now what do you think "Sarto" might mean? (No reply.) Have you ever seen the word "Sartor" anywhere?

P. Yes. Carlyle's *Sartor Resartus.*

T. Do you know what that title means?

P. No.

T. Well, it means "the tailor re-tailored". Carlyle's *Sartor Resartus* is a book which you ought to read sometime later—put it on your list. The main idea of this book is that the world wears clothes: that to most men it is full of deceiving shows and confusing appearances, but to the man who can see through these shows and appearances, who penetrates to their deeper meaning, it is a world full of revelation, one which reveals a vital principle. Yes, *Sartor Resartus* means the tailor re-tailored. Italian came from Latin. What evidently does the Italian word "Sarto" mean?

P. Tailor.

T. What would "del" mean?

P. Probably "the".

T. Then what would the full title "Andrea del Sarto" mean?

P. Andrew the tailor.

T. Was he a tailor?

P. No. We know from what you read us that he was a painter.

T. How, then, do you suppose he would come to have such a name?

P. Probably his father was a tailor.

T. Yes. The title means literally, "Andrew of the tailor". We might say, "the tailor's Andrew", for Andrea del Sarto. What, then, do we know of Andrea del Sarto?

P. We know his name, his nationality, his father's occupation, and his own.

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[1] A boy by the name of Andrew answered, and the class enjoyed a moment's humor.

T. (Reads) "Called the Faultless Painter." What does that mean?

P. That he is perfect.

T. Does faultless mean perfect?

P. I don't know—I don't believe so. You might not be able to find fault with a thing even if it were not perfect. Take a brick; it might be faultless but not perfect for a certain piece of work; it might not be the right color.[1]

T. Yes. Now, Andrea is called the faultless painter. In what sense do you think he could be a faultless painter, yet not a perfect painter?

P. His painting might be faultless in outline but the faces not have the right expression.

T. In other words, in what respect would it be perfect?

P. Perfect in all mechanical parts.

T. A better word than mechanical—

P. Technique.

T. Very good. This painter, then, is perfect in technique. We might say, in the mechanics of painting. Why are the words "The Faultless Painter" in quotation marks?

P. Because that's what they called him then.

T. Yes. Let me read to you what Symonds says about this point:

> "The Italians called him *Il pittore senza errori*, or 'the faultless painter'. What they meant by this must have been that, in all the technical requirements of art, in drawing, composition, handling of fresco and oils, disposition of draperies, and feeling for light and shadow, he was above criticism. As a colourist he went further and produced more beautiful effects that any Florentine before him. His silver grey harmonies and liquid blendings of cool yet lustrous hues have a charm peculiar to himself alone. We find the like nowhere else in Italy. And yet Andrea cannot take rank amongst the greatest Renaissance painters. What he lacked was precisely the most precious gift—inspiration, depth of emotion, energy of thought."

T. Do we know Andrea's time yet?

P. Well, it was the time of the Renaissance.

T. When was that?

P. About the fourteenth, fifteenth, and sixteenth centuries.

T. Yes, that will do. Andrea del Sarto was born about 1486 and died in 1531. Let us now read together some of the opening lines of the poem:

"But do not let us quarrel any more,
No, my Lucrezia! bear with me for once:
Sit down and all shall happen as you wish.

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[1] In effective teaching, as much is accomplished by what is omitted as by what is actually done. Again and again the teacher of poetry must exercise judgment and decide immediately whether a point in a particular answer is worth following up or not. A poor parallel or figure, if far pursued, will only divert the minds of pupils and possibly lead them down a blind alley. The illustrations that truly illustrate, that is, throw light upon, are the only ones worth pursuing. In this case the teacher evidently thought it inadvisable to follow up the figure.

You turn your face, but does it bring your heart?
I'll work then for your friend's friend, never fear,
Treat his own subject after his own way,
Fix his own time, accept too his own price,
And shut the money into this small hand
When next it takes mine. Will it? tenderly?
Oh, I'll content him—but to-morrow, Love!
I often am much wearier than you think,
This evening more than usual: and it seems
As if—forgive now—should you let me sit
Here by the window, with your hand in mine,
And look a half-hour forth on Fiesole,
Both of one mind, as married people use,
Quietly, quietly the evening through,
I might get up to-morrow to my work
Cheerful and fresh as ever. Let us try.
To-morrow, how you shall be glad for this!"

T. (Reads again):

> "But do not let us quarrel any more,
> No, my Lucrezia! bear with me for once:"

T. How many characters are there?
P. Two.
T. Who are they?
P. Andrea del Sarto and Lucrezia, his wife.
T. Where are they?
P. Evidently in the studio.
P. Near the window. See line 14.[1]
P. They are standing.
T. Yes. Andrea and his wife appear to be standing in the studio near the window. And what has happened before the opening of the poem?
P. They have had a quarrel.
T. In what mood is Andrea now?
P. Well, he is not in a good humor. The first two lines are appealing.
T. What other adjective could you use to show his attitude toward her?
P. He is very tender with her.
T. What words show it?
P. "My Lucrezia! bear with me for once:
Sit down and all shall happen as you wish."
T. Yes. The first touch, "*bear* with me for *once*", indicates a rather timid, apologetic attitude on the part of Andrea. We know from Vasari that, whatever his faults, Andrea is a better husband than Lucrezia is a wife. His yielding is therefore a mark of weakness. Now, what is it that she asks?

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[1] The readiness of such answers may impress the reader as somewhat unreal. To indicate the pauses and moments of delay, when students are doing their thinking, is, of course, not possible in a report of this kind, even if it were desirable. In this case, it should be noted, the teacher had the faculty of keeping her class keyed-up; moreover, she had had her students in training for some time.

P. That he shall paint a picture for her friend's friend.

T. Yes. In the painting, you see, Lucrezia holds in her hand the letter which probably requests this. (Reads): "You turn your face, but does it bring your heart?" Now, just what is in Andrea's mind when he says, "You turn your face"?

P. I don't know.

T. Does he doubt her love for him?

P. Yes, I believe so.

T. Now, what does "but does it bring your heart" signify?

P. He longs for her sympathy.

T. I wonder if he is likely to get it? What about the expression on her face? (Referring to print.)

P. It is cold.

P. I don't like her.

P. She looks determined.

T. Yes; that is good. (Reads):

> "I'll work then for your friend's friend, never fear,
> Treat his own subject after his own way,
> Fix his own time, accept too his own price,
> And shut the money into this small hand
> When next it takes mine."

Why say, her friend's friend. Why not have him say that he will work for her friend?

P. It is more of a sacrifice for him to work for her friend's friend.

P. Andrea would know Lucrezia's friends, but he wouldn't likely know her friend's friends.

T. Yes.

P. It makes it more remote. He is not going to favor one of his own friends by painting a picture for him; he isn't even going to paint one for his wife's friend, but for a friend of his wife's friend.

T. Yes. Very good. (Reads):

> "Treat his own subject after his own way."

What does he mean when he says, "Treat his own subject"?

P. Treat some subject chosen by the friend.

T. "After his own way"?

P. Well, probably the friend doesn't want it just the way Andrea would likely do it. So Andrea says he'll do it any way to suit the friend. He sells himself just to please Lucrezia.

T. Yes. Lucrezia has been teasing her husband to paint a picture for her friend's friend. He didn't want to do it, and the quarrel referred to in line one had evidently been over the painting of this picture. Now he gives in, for the sake of peace. He accepts the subject though he apparently doesn't like it, and he says he will even treat it as the friend wants him to. Yes, he *does* sell himself just to please

Lucrezia. Is he likely to paint a good picture under these conditions?

P. No. I don't think he is.

T. Why?

P. I think a man does really good work only when he is happy. Andrea isn't happy; so I don't see how he could put much life or joy into his painting.

P. He sells himself, gives up his ideals; he isn't true to his art. He gives up his ambition for the sake of Lucrezia, and just to make some money for her.

P. Andrea doesn't want to paint the picture at all. He is going to do it only so that he may give Lucrezia some money. Wordsworth wrote *The Green Linnet* that we read only because he wanted to; and I don't believe a painter could paint a good picture unless he felt like doing it.

T. Yes. That is all very good. We know from other sources that Andrea gave promise of being a very great painter. He might even have rivalled Raphael. But he was led on by his selfish and ignoble wife; he gave himself up to her and lowered his ideals; he fell into a sort of "cold correctness",—that is why he is called the "faultless painter". In all his later work there is just one type—his wife. I agree with you, and think it is not possible for any one to do really good work unless he enjoys doing it; and that is especially true of poets, painters, and other artists. (Reads):

> "And shut the money into this small hand."

What does this line suggest with regard to Lucrezia?

P. That she has small, beautiful hands.

P. He almost says so in line 21.

T. Yes. And if you will look at line 26 you will see that he calls Lucrezia his "serpentining *beauty*". Why does Andrea give in to Lucrezia in everything and beg her not to quarrel any more?

P. Because he wants to be with her.

T. But *why* does he? She is quarrelsome and asking him to do what he doesn't want to do.

P. Because she is beautiful.

T. Yes. He is infatuated with her beauty. Andrea loves her not so much as her husband, perhaps, as he does as an artist. Is there anything else suggested? Anything about her character?

P. That she loves money. I think the word "shut" shows that.

T. Yes. That is a good suggestion. (Reads):

> "When next it takes mine. Will it? tenderly?"

What does he show here?

P. He wants sympathy.

P. He wants her company.

T. Yes. Andrea wants to have Lucrezia by him because she is so beautiful in his eyes, but above all he seems to yearn for some interest on her part, some sympathy with him and what he would like to do. Does he get it now?

P. No. She doesn't even give him her hand after he has promised to give her the money he makes from painting the picture.

T. I don't wonder that he says, "tenderly". Do you remember that Vasari says that "none could escape her blows"? Evidently this little, beautiful hand that Andrea worshipped so was capable of cruel blows. He longs to have it given to him *tenderly.* (Reads): "Oh, I'll content him." Why does he say this? (No answer.) Doesn't Andrea break in rather quickly with that? Why should he say suddenly, "*Oh*, I'll content him"?

P. Well, I suppose Lucrezia did something.

T. What do you think she probably did? What *had* they been doing?

P. They had been quarreling.

T. Well then?

P. I suppose Lucrezia was annoyed with Andrea's pleading with her, and she looked as if she were going to begin to quarrel again.

T. Why should she want to resume the quarrel? Hadn't Andrea promised to do everything she asked, and just as she wanted it?

P. I think so.

T. What about that expression, "but to-morrow, Love!" What does that refer to?

P. Oh, I see. Lucrezia wants him to begin the painting that very day. Andrea wants to sit and talk with her and worship her beauty.

P. I can imagine I hear Lucrezia say, "I want you to begin this *right now.*" I don't like her.

T. I can sympathize with that feeling; and I am glad you can see and hear Lucrezia so vividly in imagination that you can guess what she would probably say. That is all good. (Reads):

> "I often am much wearier than you think,
> This evening more than usual: and it seems
> As if—forgive now—should you let me sit
> Here by the window, with your hand in mine,
> And look a half-hour forth on Fiesole,
> Both of one mind, as married people use,
> Quietly, quietly the evening through,
> I might get up to-morrow to my work
> Cheerful and fresh as ever. Let us try."

(Repeats):

> "I often am much wearier than you think,
> This evening more than usual:"

Why does Andrea mention this?

P. He wants to get her sympathy because he is tired.

T. Does he get it?

P. No. She's as hard as a nut.

P. There's no sympathy between them; at least Lucrezia has none for Andrea.

T. (Reads):

> "and it seems
> As if—forgive now—should you let me sit
> Here by the window, with your hand in mine."

Why does he say, "forgive now"?

P. I guess he's afraid.

P. Andrea is making a dangerous proposition. He's feeling his way.

P. She seems to be boss; Andrea has to ask permission to sit by the window with her.

T. Yes. Lucrezia doesn't seem to care anything at all about Andrea. She doesn't care to have him show any affection for her at all. He is afraid she will take up the quarrel again, but he wants to sit there and enjoy the evening with her. Even a half-hour would be something. (Reads): "And look a half-hour on . . . " Who can pronounce this name? (No reply.) (Teacher writes it on the board and then indicates the pronunciation Fe-â-so-le.) Can any one point it out on the map? (After a little searching, a student pointed it out.) Yes. Fiesole is a little town that crowns one of the hills to the north of Florence, about three miles away. If you ever visit Italy, you will find it to be a very picturesque little place.[1] (Reads): "Both of one mind." Were they usually that?

P. No. They seem to spend a good deal of their time quarreling.

P. There is no sympathy between them.

T. (Reads): "As married people use"; what does he mean by that?

P. Are used to do.

T. Perhaps better, "ought" or, "are wont to do". (Reads): "Quietly, quietly the evening through." Why, do you think, is "quietly" repeated?

P. Because Andrea longs for peace. He hates to quarrel, and he wants a quiet evening for once.

T. Yes. I think that is right; "quietly" is repeated for the sake of emphasis. I suppose Andrea didn't have many quiet evenings, certainly not with Lucrezia sitting pleasantly by him. Andrea would like to sit this evening with Lucrezia and look out upon Fiesole. He is an artist and would enjoy her beauty and the beauty of the scene. Class, with whom is your sympathy so far?

Class. (In unison) With Andrea!

T. (Reads):

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[1] The teacher had visited Italy.

"I might get up to-morrow to my work
Cheerful and fresh as ever."

What do these lines show?

P. That he usually doesn't get up cheerful.

T. How does he usually get up?

P. Cross, I guess.

T. Yes. I suppose so. He says, "fresh", too; what does he mean by that?

P. Well, he doesn't take any interest in his work any more, because Lucrezia doesn't take any interest in him or his work.

T. I think that is true. Andrea lost his ambition, his hopes, his ideals because he enslaved himself to Lucrezia, and she apparently did not care for him at all. But there is something else; he says, "as ever"; what does that signify?

P. That he *used to be* cheerful and feel fresh for his work.

T. Yes. (Reads): "Let us try." There Andrea pleads again; there's the yearning for sympathy and companionship that we saw a while ago. (Reads):

"To-morrow, how you shall be glad for this!"

Why does he say that?

P. I don't quite see.

T. Well, if Lucrezia does as Andrea wants her to now, what will he probably do for her tomorrow?

P. I suppose he will work all the better for her.

T. Yes. Notice that Andrea goes on to speak of Lucrezia's soft hand. She has apparently acceded to his request. They probably sit down and Lucrezia gives Andrea her hand. Browning implies that this action takes place, but he does not tell us. Where have we seen him do this sort of thing before—action implied by the poet as taking place, but no definite statement?

P. In *My Last Duchess*, just at the close.

T. Quite right. (Reads):

"Don't count the time lost, neither; you must serve
For each of the five pictures we require:
It saves a model."

Why does Andrea mention this? (No reply.) Does Lucrezia seem to resent it?

P. No.

T. I may be wrong, but I imagine the friend referred to wanted a painting of Lucrezia,—see line 236. Of course he does say, "Treat his own subject", but it is just possible that Andrea is trying to persuade Lucrezia to consent to being the model for other paintings because he has consented to paint a portrait of her for a friend's friend. He says, "Finish the portrait out of hand." Why does he say, "It saves a model"? (No reply.) Would Andrea have to pay a model?

P. Yes.

T. Well then?

P. Lucrezia likes money, and if she serves as a model she probably can have the money that would have been paid to a model.

T. What adjective do we apply to a person who likes money for its own sake?

P. A money-lover.

T. But I said, "what adjective?"

P. Mercenary.

T. Do you think Andrea may have any other reason than saving money for asking Lucrezia to serve as a model? (No reply.) Well, did he like to look at Lucrezia? Wasn't she beautiful?

P. Yes. He probably wanted her to be near him, and this was a good excuse.

T. Yes. Andrea wants Lucrezia near him, but he appeals to the mercenary side of her nature in order to persuade her. (Reads):

> "So! keep looking so—
> My serpentining beauty, rounds on rounds!"

Why should he call her "*serpentining* beauty"? What do you think he might mean by "*serpentining* beauty", and "rounds on rounds"? (No reply.) Well, turn for a moment to lines 175-6.

P. (Reads):

> "Let my hands frame your face in your hair's gold,
> You beautiful Lucrezia that are mine!"

He is speaking of her hair; it is golden and put up in coils; "serpentining" and "rounds on rounds" evidently refer to Lucrezia's hair.

T. Yes. (Reads):

> "How could you ever prick those perfect ears,
> Even to put the pearl there! oh, so sweet—
> My face, my moon, my everybody's moon,
> Which everybody looks on and calls his,
> And, I suppose, is looked on by in turn,
> While she looks—no one's:"

Yes. Lucrezia is evidently beautiful. What do you think Andrea means when he calls Lucrezia "my moon, my everybody's moon"? (No reply.) Well, look at the face in the picture.

P. It is round, like the moon.

T. Yes. I think that is the idea. Line 26 also carries some suggestion of roundness of the face. One other possible explanation is that it refers to the effect that Lucrezia has on Andrea, affecting him in her moods, one of which she is in now, as the moon affects the tides. It may be something of the same idea that Tennyson had in his *Dream of Fair Women* where he describes Cleopatra:

"Once, like the moon, I made
The ever-shifting currents of the blood
According to my humour ebb and flow."

Now, what is it, evidently, about Lucrezia that has taken hold upon Andrea?

P. Her beauty.

T. Yes. Does he speak of her qualities of character?

P. No. He speaks of her beautiful hair, her pretty ear, and so on.

T. Yes. That is very interesting. Andrea is evidently won by the physical beauty of Lucrezia. He has a sort of physical point of view. He is content with the loveliness of physical things. He doesn't seem to care so much about Lucrezia's character. In fact, he has shown no indignation that his wife has a lover, as she apparently has. He is indifferent to that. He is content if only she will sit by him. She is beautiful. He wants her by him for that reason only. Then he may admire her hair, her pretty ear, her beautiful face. (Reads): "While she looks—no one's." What does he mean by that? (No reply.) Doesn't it tell us something of her response to the admiration she receives?

P. Yes, I believe so.

T. Well, then, what is it?

P. She is cold.

T. Yes. (Reads): "no one's." Did she not belong to her husband?

P. Certainly.

T. But from what Andrea says, she acted as if she belonged to *no one at all.* That, I think, is what he means. She is cold in temperament and utterly selfish. She is beautiful but soulless. Look at the picture again. Think of some kind and generous person, and tell me if you find anything like that person's expression in this face.

P. No. It is cold.

P. There is no smile.

P. She isn't even looking at him.

P. It is too hard to be kind.

T. Yes. I think you are right. Lucrezia is a self-centered beauty. She is not only cold and indifferent to her husband but incapable of any kind of strong feeling for anybody or anything. She has no heart. She is utterly selfish. Can any one tell me where there is a character in an author, some of whose works we have read, that is of the same type? (No reply.) What about Rosamond Vincy in *Middlemarch?*

P. Yes. I've read it. She's the same sort.

T. (Reads): "Very dear, *no less.*" What does he mean by that?

P. He knows she hasn't any heart, but she is still very dear to him.

T. Yes. That is an interesting point. Why is she very dear to him?

P. Because she is beautiful.

T. Has he said anything about her mind or character?

P. No. She doesn't seem to have much of either.

T. Quite true. It seems, then, doesn't it, that Andrea knows well enough that he is bound to Lucrezia by her beauty only, but lacks the will power to break away from her. From Vasari we know that Andrea lowered his ideals—look at line 39, where Andrea practically says so—and that he is conscious of his degradation and failure. Still Lucrezia is "very dear, no less". Then he says, "You smile?" Why should Lucrezia smile? (No reply.) Well, has he not just said she is *very dear* to him?

P. Yes.

T. And has he not also said she "looks—no one's", not even his, as we have seen?

P. Yes.

T. Well, from what we know about the cause of the quarrel and all, do you see no reason why Lucrezia might smile?

P. (After a pause)[1] I guess she thought he was a kind of fool. He seems to be foolish about her just because she is pretty, yet he knows she must have lovers. One of them wants her to get him to paint a picture. And he is going to do it. He will do anything for her if she will sit by him and let him hold her hand. He strikes me as pretty soft.

T. Yes. I think you have the right idea. We might phrase it a little better. Andrea seems to think that Lucrezia is indifferent to *everybody*. She looks—no one's, he says. *She* knows she is *not* altogether indifferent; she has a lover, and she smiles a cynical smile as she thinks how Andrea is deceived. (Reads):

> "Why, there's my picture ready made,
> There's what we painters call our harmony!"

How does Andrea regard her smile?

P. He only sees how pretty she looks.

T. Does he suspect what is going on in her mind?

P. No. He sees only how pretty she looks when she smiles.

T. Yes.

P. Andrea strikes me as a plumb fool.[2]

T. I think you are right. I believe that is part of the idea that Browning wishes to bring out in the poem, though it would be best to express the idea in better language. Andrea is lured on by Lucrezia; he is finally ruined, as artist and as man, by her fatal beauty and soulless heart. Lucrezia here smiles a cynical smile; she knows she is deceiving him, but Andrea thinks it is a smile of pleasure at his praise of her beauty. Will you please read to the middle of line 49, beginning with "A common grayness".

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[1] Where the pauses are noted, the teacher allowed a special amount of time for the pupil to work out the idea.

[2] It is when pupils become strongly interested in character that they are especially likely to express themselves in colloquial form. The teacher should stimulate the pupil to express the same idea in better language, without doing or saying anything to dull the interest or repress spontaneous expression of opinion.

P. (Reads):

"A common grayness silvers everything—
All in a twilight, you and I alike
—You, at the point of your first pride in me
(That's gone, you know)—but I, at every point;
My youth, my hope, my art, being all toned down
To yonder sober pleasant Fiesole.
There's the bell clinking from the chapel-top;
That length of convent-wall across the way
Holds the trees safer, huddled more inside;
The last monk leaves the garden; days decrease,
And autumn grows, autumn in everything.
Eh? the whole seems to fall into a shape,
As if I saw alike my work and self
And all that I was born to be and do,
A twilight-piece."

T. Thank you. Let us look at this passage together for a little. What is the dominant tone of these lines?

P. Sad.

P. Mournful.

P. Melancholy.

P. Disappointment.

P. Hopeless.

T. Yes. I think we might apply Andrea's own words to this passage: it is "a twilight-piece". The tone is, as has been suggested, that of melancholy, hopeless resignation. The sadness of autumn, and especially of autumn twilight, has crept over the mind of Andrea and the scene upon which he is looking. How do you think Browning produces this tone? You will remember that we have seen that adjectives and verbs[1] are especially important in poetry.

P. He uses "silvers", "toned down", "sober", "clinking", "huddled", "last monk", "leaves", "decrease", "twilight". All these words give a common tone to the piece.

T. Yes. Very good. And that tone belongs to what?

P. To the scene.

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[1] The attention of pupils had previously been drawn to this fact. It had, moreover, been connected in a practical way with their work in composition. Pupils had been advised, as a means of giving force and virility to their writing: "Put your main ideas in your verbs". They had become quick to see and feel the difference, for example, between such expressions as, "I have great hopes", and, "I hope great things"; between, "My understanding of your proposition," etc., and, "I understand you to propose that," etc. The attention of those who knew some Latin was drawn to the fact that much of the effectiveness of Latin prose is due to the fact that Latin expresses its main ideas through the verbs, and that there is a very small percentage of abstract nouns. A very great deal can be done incidentally by the skillful teacher to offset the common student-notion that, because subjects are separated in the curriculum, they are separated in reality. Especially likely are pupils to think that poetry has little connection with anything else, particularly anything that is of a practical character.

P. Yes, and to Andrea's mind, too. He's sad. He says himself that he sees his work and himself as a sort of twilight-piece.

T. Yes. Very good. How about the language?

P. I like it.

T. But why?

P. It is musical. I like that "There's the bell clinking from the chapel-top". I once lived near a chapel, and I think "clink", is a good word to describe the sound of the bell.

T. Very good, indeed. I think you are right in saying that the language is musical. Notice the slow movement of that line, "The last monk leaves the garden; days decrease"; it seems almost to drag; you can't read it rapidly. The language is not only musical; it is of the same tone as Andrea's mind and the scene upon which he is looking. Browning has, I think, produced a fine *harmony* in these lines; they combine into a perfect unity:—the mood of Andrea, the tone-quality of the scene described, and the music of the verse are very successfully blended together. Browning is often charged with being rugged in his verse, but the charge cannot be borne out here. Tell me now, please,[1] what Andrea means when he says:

> "—You, at the point of your first pride in me
> (That's gone, you know)—but I, at every point".

P. I think he means that Lucrezia has lost only her first pride in her husband.

T. Yes.

P. Andrea has lost everything: his youth, his hope and ambition, his art.

T. Yes. Very good. All his youthful hopes and ambitions, all his fine aspirations have passed away. He is already in the evening of his life. He feels it and says it. Please comment on the line:

> "Holds the trees safer, huddled more inside".

Do you get any suggestion from "Holds safer" and "huddled"?

P. The convent wall suggests protection for the trees, and they seem to gather together, as if they felt the protection.

T. Yes. Some one has said that we find in things just what we bring. Is this true of Andrea here?

P. Yes. I think it somehow seems like Andrea.

T. Where do you naturally think of a great, strong tree's being? Behind a wall or out in the open?

P. In the open; probably in a forest.

T. Yes. Do trees grow well when they are huddled together?

P. No. They need room and air and sunshine.

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[1] The teacher's manner and address just here showed that she shared in and responded to the evident "mood" of the class. These are rare opportunities and sacred moments.

T. But they are *safer* behind the convent wall.

P. Yes, I suppose they are safer, but they can't grow as well.

T. Very good. Now if Andrea finds in the scene before him something that seems to fit into his own life, what do you think it is? Is there anything in his own life that corresponds to the trees' being behind the wall, "safer" and "huddled" for protection?

P. Well, Andrea says he has given up his hopes and everything. He aint living in the world any more, like the tree in the forest.

T. Yes. That is good. Of course you meant to say, "He isn't living in the world any more."

P. Yes.

T. Now will some one state clearly for us the parallel that Andrea implies.

P. The trees are huddled together inside the convent wall. They are safer, but they haven't room to grow. Andrea feels safe in his own home, and happy if only he has Lucrezia with him, but he feels that he might have grown, might have become a Raphael even, if he had lived his life in the world.

T. Yes. Very good. I think that is just the point. Andrea gives up to this seclusion, and to painting pictures for Lucrezia's friend's friends, just to be with Lucrezia, who has exerted an unfortunate fascination over him. He regrets his lost opportunities, his possibilities for inspiration, growth, and development that would doubtless have come to him if he had lived his life among men. He seems to know perfectly well what Lucrezia has meant to him, but he seems powerless to shake himself free from her influence. Worst of all, he seems now to be *content to remain so*. (Reads):

> ". . . Love, we are in God's hand.
> How strange now, looks the life he makes us lead;
> So free we seem, so fettered fast we are!
> I feel he laid the fetter: let it lie!"

What light do these lines throw on Andrea's character?

P. They show us something of his religion.

T. Yes. What is that something?

P. Well, he thinks God controls everything.

T. What is the tone? Is Andrea happy in that thought?

P. No. I think he is bitter. He says we are "fettered".

T. What else does he say?

P. That God "makes" us lead a certain life; that He "laid the fetter".

T. Good. Now, do you think Andrea is sincere in this? Does he really believe what he says?

P. No. I don't think so. He knew that he could have done something if he had really wanted to.

T. Where does he put the responsibility for his not having done anything?

P. On God.

T. But he knows that he is himself responsible?

P. Yes.

T. What kind of religion do you call that?

P. (After several incorrect replies) Fatalism.

T. Yes. Andrea is a fatalist; not a very sincere fatalist, I think, but still a fatalist. Fatalism, the doctrine that everything is fixed by Fate, that man's will has no determining power, the doctrine that makes people blame God or one's people or society, is often the refuge of weak characters like Andrea. Notice how Andrea half excuses himself when he says "let it lie", by showing a willingness to submit. He really contradicts himself when he says that, because he implies that he *could* remove the fetter if he really wanted to. You remember that Hamlet did the same kind of thing toward the close of the play. Can any one quote lines showing that?

P. "There's a divinity that shapes our ends,
Rough-hew them how we will."

T. Yes. Very good indeed. We all tend, in our moments of weakness, to put the burden of our faults on God or fate or circumstances or other people. Often, when we don't get along well at school we blame the school, when the fault lies with ourselves. I wonder if any one can tell me what makes us do this?

P. We give up.

P. We quit trying.

T. Well, what is the matter when we quit trying?

P. Maybe we're tired.

T. Yes. That happens sometimes. But when we quit trying altogether, not just at the times when we are tired?

P. I suppose we get lazy.

T. Just the point precisely. The real trouble with Andrea here is that he is lazy. The real trouble with us when we *cease to try* is that we become lazy. Andrea gives himself up to a pleasant, sensuous love for Lucrezia. He enjoys that; quits his work; gives up his ambitions; lets things go; blames God; tries to convince himself that *God* is at fault. He thinks he excuses himself because he is willing to have things as they are. The root of all evil is not money but laziness. Andrea's supposed fatalism is the religion of a man who gives up ambition and effort for the sake of the sensuous beauty of his wife Lucrezia. This is what she has brought him to. We shall see, before we get through with our study, that the poem reveals for us the conflict between Andrea's art and his infatuation with a beautiful but heartless and wicked woman. We know now something of the effect upon his work; we shall soon see more clearly what the effect was upon his character.

And thus the lesson continued.[1] Five minutes before the close of the hour the assignment for the next day's recitation and study was given:

For tomorrow: (1) Tabulate, with line references, the characteristics of Andrea del Sarto that you have learned so far; (2) Tabulate, with line references, the characteristics of Lucrezia; (3) Read in the encyclopaedia under Fiesole, Florence, and Andrea del Sarto.

On the following day, a review of the work of the preceding day was naturally first taken up.

T. What do you know of this poem from the title and from the parenthesis?

P. From the title we know that this is a poem about Andrea del Sarto, an Italian, the son of a tailor. From the parenthesis we know that he was considered by his contemporaries a faultless painter—that is, faultless in technique.

T. What characteristics of the man do you learn from the lines we read yesterday?

P.	Tenderness toward Lucrezia	line 3
	Forbearance	line 5
	Craving for sympathy	lines 12-19
	Love of physical beauty	lines 26-29
	Melancholy	line 35
	Lost ambition	lines 39-40
	Resignation, Fatalism	lines 49-52
	Lack of Will	lines 59-61
	Genius	lines 70-71

T. Do you agree with all the terminology?

P. I think line five expresses more his sympathy or his love for his wife than his forbearance.

P. I think those lines show weakness.

P. I think those lines show lack of ambition and lack of will.

T. What do you understand by lack of will?

P. When a man knows what he ought to do, but doesn't try to do it.

T. What is frequently the next step?

P. An attempt to shift the responsibility; he excuses himself, and puts the blame on some one else.

T. What do you call a man that does that?

P. A fatalist. When Andrea del Sarto does not place the responsibility upon his wife he places it upon God.

T. For which of these characteristics do you condemn him most severely?

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[1] The actual class hour has been disregarded in order to bring the exercise to what seemed to be a significant breaking point.

P. His fatalism.

T. Why?

P. He says he could do better, he knows he could do better, but he does not, and he excuses himself by saying: "Love, we are in God's hands".

T. Name Lucrezia's chief characteristics.[1]

P.

Mercenary	lines 8, 20, 25
No love and sympathy for her husband	lines 4, 11, 37, 53
Vain	lines 29, 33
Cynical	line 33
Faithless	lines 5, 30

T. Which characteristic is emphasized?

P. Her love for money.

T. Do you learn anything from the encyclopaedia that you had not learned so far?

P. Andrea del Sarto was born in Florence, a city noted for its arts and sciences, and he became a great painter. He lived in the latter part of the fifteenth century and the early part of the sixteenth. He was a painter of the Renaissance time. He studied with Michael Angelo, and Cosimo was his principal instructor. He was called to France and stayed at the court for some time at the king's palace. Then he returned.[2]

The lesson was then developed as before to line 140, and the assignment was given:

> For tomorrow: (1) Add to your characterization of Andrea del Sarto and Lucrezia what you have learned from the lines read today. If the characteristics you have previously seen have been emphasized, add the new line references; (2) If you condemn Andrea del Sarto, state clearly why; (3) Find from the encyclopaedia something about Michael Angelo and Raphael, painters, who are mentioned in tomorrow's lesson. Know at least one picture of each painter; (4) Read in advance to line 210.

The next day, a book on Andrea del Sarto was brought to the recitation by the students. Postcards of the best pictures of Raphael, and Michael Angelo, as well as picture postcards of their portraits were brought by the teacher. Features of the Sistine Chapel, the Sistine Madonna, Mona Lisa, the Transfiguration, were pointed out and discussed in detail. Such questions as, "Who are the greatest painters? Why did these men excel others?" were raised by students. The recitation was then taken up.

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[1] The students were required to quote the lines illustrative of these characteristics as far as possible without their texts. The numbers indicate the lines quoted or referred to.

[2] Further information was added by other pupils.

T. Let us now turn to *Andrea del Sarto* again. State what you consider Andrea del Sarto's great faults.

P. I condemn Andrea del Sarto because he puts the blame on his wife and on God.

P. Andrea del Sarto has lost his ambition, and becomes a fatalist.

P. I condemn Andrea del Sarto because he sees and knows his faults and does not try to do better.

P. I condemn him because, if he does not blame fate or God, he blames his wife. He has lost his ambition. He has gained his end and has quit.

T. What do we call that kind of man?

P. A quitter.

T. A better word.

P. Self-satisfied.

T. What do you understand by "A man's reach should exceed his grasp"?

P. No matter what a man gains he should always have a higher ambition. He should continue to strive. His ambitions should be a sliding scale, and as one ideal is obtained, his ambition should mount higher. His reach, that is, his desires, should exceed what he can actually attain.

T. Illustrate by Andrea del Sarto.

P. He can paint perfect pictures, but he is willing to stop there. He does not put any soul into his pictures and does not try to. His reach and his grasp are the same.

The recitation was then continued, emphasizing Andrea del Sarto as a man, the students giving again line references to the poem and discussing main points. The study of the poem extended to line 250. The following assignment was then made:

Let us see what others say about the idea in line 97: "A man's reach should exceed his grasp". For tomorrow: (1) Read Tennyson's *Ulysses*, *Crossing the Bar;* and re-read *Prospice;* (2) If possible, choose a line from each poem that sums up the poem; (3) Taking Browning's idea in *Prospice* as his own ideal, criticise Andrea del Sarto, when he says: "I am grown peaceful as old age tonight"; (4) Cite illustrations from life and from literature of men who are Andrea del Sartos, and of old men who are like Ulysses; (4) Read the rest of the poem.

The last day was concerned with the discussion of the attitude of other poets toward old age, summarizing of Andrea del Sarto's characteristics in the order of their importance, and the working out of Browning's own ideas from the poem. The assignment for the next day as an assignment for recitation only was:

(1) Read *Andrea del Sarto* aloud, and by your voice bring out, as well as you can, the meaning and spirit of the poem.

T. Andrea is talking: what will your voice have to express?

P. At times it will be pleading, at other times sarcastic, repentant, bitter, and scornful.

When the class-study of the poem was completed, the teacher commented briefly on *Andrea del Sarto* in a general way, and made some observations about Browning. The pupils took notes.[1]

T. This poem seems to me to be one of the very finest of Browning's shorter poems, whether we think of it as a study in character or consider it from the point of view of form. Let me say just a few words first about its form.

In some of Browning's poems we have found frequently an almost harsh and crabbed style, and a vagueness and obscurity of meaning. At times we were almost repelled instead of charmed with his poems, until we worked out their meaning together. In this poem it is different. The style is colloquial; it is almost conversational, just as if one person were talking to another; one almost forgets that it is verse. When we scanned several lines together, I pointed out one of the chief reasons for this colloquial effect. It was?

P. The shifting of the caesura.

T. Yes. That is right. *The great variation in placing the caesura* breaks up the regularity of the verse in such a way as to make us almost forget that we are reading verse. It makes the language smoother. But there is a further reason why the style of this poem should be so different from most of Browning's other poems. We have touched upon this in our reading; can any one tell me what it is? (No reply.) Well, we saw, did we not, that Andrea lacked ambition, that he had no great aim, no great purpose to win?

P. Yes. He has no life; he has no force.

T. Very good. As a consequence of that fact, how does he talk?

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[1] They had been trained to get the gist of the teacher's remarks when occasion demanded. This is an admirable part of a pupil's training and should be required by all teachers.

P. In a quiet way.

T. Just the point. Andrea's *mood* very largely affects the style of this poem. He has given up, has resigned himself to Fate. He has no force, no fire or life. Moreover, he is sentimental; he says he is grown as peaceful as old age; all is quiet feeling. He is passive, quiet, melancholy. And it is just in this *tone* that Andrea talks. If he were overflowing with ambition, eager to do and achieve something, deeply moved by passion, he would doubtless speak in Browning's usual forceful, broken, animated style. Yes, *Andrea's mood* has a very great deal to do with the style of this poem. It makes it simple, clear, even colloquial. That makes it a good poem to study. You understand it, don't you?

P. Yes.

T. Now observe carefully what this leads us to. If the style of this poem differs from Browning's usual style, and the style in this case is determined largely by the speaker's mood, what may we say?

P. Browning usually didn't write about this sort of man.

T. Yes. What sort of men did he write about?

P. People with more life and passion.

T. Yes. That is good. Then Andrea lacked in . . . ?

P. Passion; in ambition to do something.

T. Yes. Notice, then, one point that appears to be characteristic in Browning: he sees a very close connection between a man's work and the man himself. Andrea's paintings lacked soul and life because Andrea himself lacked soul and life. Andrea had become faultless in technique, but his work lacked real excellence because it lacked soul. Here we get a good idea, not only of Browning's conception of the close connection between a man and his work, but also of his ideal of art; it must have *soul.* With Browning, all art must be *full of life* to be good; it must contain great ideas; it must indicate ideals; mere perfection of form is not enough. So much, briefly, for his art.

This leads us to ask through what medium Browning chiefly revealed his ideas. How does Browning usually let us know what he thinks and feels? What does he talk about?

P. Men and women.

T. Yes. And this poem is no exception; rather it illustrates the rule. It is one of the finest examples of Browning's *portrayal of character.* Browning depicts for us a man and a woman. And he does so with such truthfulness that we never once stop to think that his portrayal may not be correct. We feel that both Andrea and Lucrezia are very real. We know them better than we do many of our friends, for we have seen into their very souls. They are types of human nature that any one can recognize almost at a glance. Yes. Browning has here given us a very vivid portrayal of human nature. He deals chiefly with images of human beings in order to reveal his own ideas and feelings. Browning uses images of human beings as his material. In the third place and finally, let us see what notion of life Browning has, as he reveals it in this poem. Is passion a good thing?

P. Yes. In Browning anyway.

T. Yes. Just as painting must have soul and life, so man must have a passion for something. Some people think they are perfect; perhaps they are; but Browning would say they were more surely dead than if they were in their graves. Faultlessness in life, like faultlessness in painting, means spiritual death. The man who, like Andrea del Sarto, sacrifices or degrades emotion or passion, sacrifices and degrades his own spiritual and infinite life. The finest and best spirits in life always aspire to something beyond their reach. What a man achieves at one stage is to be used merely as a stepping-stone to the next. There is no stopping. Life is imperfect; it is imperfect so that man may grow. The end of life is not to produce some external result, to accumulate money and property, but to go on, even to the end of life, developing mind and soul. Man is getting ready for immortality; if he develops steadily he will be the better prepared for it; if he becomes lazy, if he sinks into lethargy and inactivity, he will not only not accomplish anything in this life; he will not see God.

III. SOME FORMAL ELEMENTS

This class-exercise speaks for itself. There are, of course, limits to its full significance. In the first place, the character of the poem studied excludes much emphasis upon pure beauty of phrase and line. Browning is essentially ethical, philosophical, and religious in his interests. He himself gave precedence to philosophy over poetry. In consequence, the emphasis in the class-exercise submitted was necessarily upon ethical content; relatively little was said about pure imaginative beauty, because there was little occasion for such comment. But in the study of other poets, Keats and Shelley, for instance, this phase of poetry was emphasized by the teacher. No single class-exercise or even several exercises in the study of one author can bring out, with unmistakable clearness, what a teacher aims at effecting in the course of a term or a year.

This is one limitation. A further limitation arises from the fact that the full significance and all the details, often very significant details, of a teacher's method of conducting the work cannot possibly be indicated through the class-exercise. With a view to affording some compensation for this limitation, I have discussed a number of the more essential points likely to arise in connection with such study. They are as follows:

When and How to Begin the Study of a Poem[1]

Some teachers make the mistake of beginning the study of a poem by assigning the poem or a part of it for home preparation. No practice is more likely to breed among pupils a hearty dislike for poetry. Poetry is not subject-matter for lessons; it is something to be enjoyed. Lessons there must be; but lessons will be futile unless they serve finally to deepen and broaden enjoyment of poetry itself. The study of a poem, unless the poem be of the very simplest kind, should always begin in class; if, in beginning a poem, an assignment for home study is made at all, it should be in material bearing upon the poem and essential to understanding it, not a part of the poem itself.

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[1] Cf. Arlo Bates, *Talks on the Teaching of Literature*, Chap. VIII: the best thing in the book.

The reason for this plan becomes apparent on a moment's reflection. The study of poetry in the high school implies that the poem in hand represents some thought, feeling, or action that is an ideal for the pupil. To the teacher this ideal may be very simple, very elementary, perhaps long since attained; but for the pupil it represents something relatively new or as yet unattained in experience.[1] Required to make his own start in beginning the study of a poem, lacking the inspiration of the teacher and the stimulus of the class, blocked frequently by unfamiliar allusions and confused imagery, the pupil easily becomes discouraged and turns from his task in weariness and defeat. On the morrow he does not know his "lesson". The teacher works in vain against a dogged opposition; and the finest pedagogical efforts toward stirring interest and awakening enthusiasm fall dead. The pupil is right, the teacher wrong. The pupil's lack of interest, his opposition, even his dislike for poetry are the natural and almost inevitable result of a vicious method. What the pupil usually lacks is the necessary imagery or information to make the poem intelligible to him. Without this "apperception mass", as the psychologists call it, any poem must be largely misunderstood, if indeed it does not appear to be veritable rubbish.

The method of beginning the study of a poem in class was illustrated in the exercise on *Andrea del Sarto*. Let us, by way of further illustration, briefly consider Tennyson's *The Charge of the Light Brigade*. According to one method the teacher would probably say, "For your lesson next time, read and study *The Charge of the Light Brigade*". When the class hour comes, the teacher reads the first stanza and asks, "What is a league? How much, then, is half a league?" Other questions of like character follow. Incidentally, it comes out that the poem has to do with a situation in the Crimean War; but when or where the war was, what the Light Brigade was, why Tennyson should think it worth while to write a poem upon it, nowhere appear. With this necessary background vague and uncertain, the implied ideals of fine courage, unquestioning obedience, loyalty, and patriotism are lost entirely upon the pupil.

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[1] See *The Making of Poetry*, p. 179 *et seq.*

There is another way. According to this method, there is no "lesson" at all. Pupils do not even know what they are next to read in class. Memories of the keen delight in the last poem read run pleasant expectations high. The pupil comes to class predisposed favorably to his task. Then the teacher, without having as much as opened her book or named the poem to be read, begins by asking, "Who can tell me something about the Crimean War? Where was it fought? What nations were engaged? Why? What is a light brigade?" While information is being elicited, images essential to the true understanding and appreciation of the poem are rapidly grouping themselves in the pupil's mind. Even this kind of activity has its pleasure. Some of the information the teacher herself will doubtless have to furnish. This can be given orally or by reading such a brief statement as the following:

> "The famous charge of the English Light Brigade, immortalized in Tennyson's poem, took place at the battle of Balaklava, during the Crimean War, October 25, 1854. Balaklava is not far from Sebastopol on the borders of the Black Sea. The story is a thrilling one of bravery and of obedience to orders. The full strength of the Russian army, covered from attack by thirty guns, lay at a distance of a mile and a half from the armies of the allies (English, French, and Turks). Mackenzie's *The 19th Century* gives these particulars:
>
> "Up to this time our Light Cavalry Brigade had not been engaged. Lord Lucan, their commander, now received by the hand of Captain Nolan a written order to advance nearer the enemy. On reading this order Lord Lucan asked its bearer how far they were to advance. He received a reply which he construed with fatal inaccuracy, to signify that it was his duty to charge the enemy. The Light Brigade made itself ready to attack the Russian army. Every man knew that some terrible mistake was sending the brigade to destruction, but no man shrunk from his duty of obedience. They rode straight down the valley towards the wondering Russians and in full view of the chiefs of their own army, powerless now to restrain them. As the excitement of battle gained power over men and horses the pace increased. The shot of the Russian guns tore through their ranks, but did not abate the speed of their advance, the fierceness

> of their attack. They galloped their horses between the Russian guns, cutting down the gunners as they passed. They rode down and scattered several squadrons of cavalry. And then they paused, and turned back, and galloped toward the shelter of British lines. The Russians reopened upon them with grape and canister. Their return was beset by an overwhelming force of Russian cavalry; but they cut their way through and reached the position they had left scarcely half an hour before. Six hundred and seventy men went forth to that memorable ride, but only one hundred and ninety-eight came back."
>
> Murdock's *The Reconstruction of Europe* says that the brigade would have been utterly destroyed, wiped out of existence, but for the brilliant and timely charge of a French company which attracted the attention of the Russians away from the English, leaving the valley comparatively clear for a few minutes for the retreat of the remnant of the Light Brigade."[1]

It will be a boy of thin blood who is not stirred by this account of the charge of the Light Brigade. To tell the story would be better still; for in that way there is carried home unconsciously to the pupil's mind a conviction of the kind of interest on the teacher's part that makes it worth while to have mastered the story for herself. However, even to read the story will do. Then the teacher begins, reading with vigor and the suggestion of picturing all vividly in imagination:

"Half a league, half a league,
Half a league onward"

and who can fail to see and feel the difference? It is the difference between success and failure. Now the imagination is stored with appropriate imagery for understanding the poem; some of the feelings stirred by the poem itself have already been aroused; there is an added magic in the rhythm; and the fine idealism of the poem is brought home to the pupil with an enriching power that makes him, from that moment to the end of his life, a different and a better soul. The poem has served its true end; the pupil has understood it and enjoyed it.

As a rule, it is best to present this introductory material in class; the living voice adds interest to the material, and increases the value of it to the pupil. In some cases, of course, such a plan is impracticable. If the subject-matter is too long to be conveniently handled within the hour in such a way as to make an actual beginning upon the poem, especially if the material is inherently interesting in itself, there is no good reason why pupils should not be asked to read it before coming to class.

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[1] Waitman Barbe's *Famous Poems Explained*, New York, 1908. The teacher will find it helpful.

This material, in such a case, not the poem or its opening lines, will be the "lesson" assigned. It would be an extravagant waste of time to read in class from *The Arabian Nights* a sufficient body of material to lend interest to Tennyson's *Recollections of the Arabian Nights.* The child, of course, should have been brought up on *The Arabian Nights;* but many children have had no true nursery life; they have not even heard about *The Arabian Nights.* For all such unfortunate children, Tennyson's poem must be almost meaningless until they have read somewhat extensively and with delight in *The Arabian Nights.* An assignment preliminary to the reading of Keats's *Ode to a Nightingale* would almost certainly be the biblical story of Ruth.[1] Byron's *Childe Harold's Pilgrimage*, Bryant's *To a Waterfowl*, Wolfe's *Burial of Sir John Moore*, Southey's *The Battle of Blenheim*, Tennyson's *Crossing the Bar*, and scores of other poems call for some kind of preliminary statement by the teacher or reading by the class, if the poems are to take on their true meaning and be enjoyed. Too often, I fear, teachers forget that what is unbroken sunlight to them is Stygian darkness to the child. When the pupil lacks the appropriate imagery it is useless for the teacher to say, "This is beautiful"; the pupil must be led to see and feel that it is beautiful.

As so often in the teaching of poetry, the teacher must use judgment in deciding what to do. Often it is well to make a change just for the sake of variety. A class-exercise even half anticipated by the pupil is well-nigh fruitless. For the high school pupil, interest in subject-matter and theme rather than faith in prospective pleasure and profit or even in the teacher herself must usually be the carrying medium. Always begin *in class* the study of a poem that involves textual difficulties or that represents new or unattained experiences for the child. And most poems for class study, properly selected, will involve just such difficulties and experiences. After such an introduction, after interests have been awakened and enthusiasms have been stirred, substantial assignments for home study and preparation may be safely made.

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[1] Perhaps the finest line in the poem is that descriptive of Ruth, "She stood in tears amid the alien corn." In a high school senior class of forty pupils, the writer found but two who knew the story of Ruth. To several, "corn" meant Missouri corn, "alien" meant imported, so that the common image for most members of the class was of a girl standing out in a Missouri corn-field (or in the midst of some imported corn) crying, and for no apparent reason whatever. Yet this is a beautiful line, and teachers tell their pupils so. Small wonder that pupils often think poetry rubbish, their teacher a pretender, and that they themselves become prigs and hypocrites instead of lovers of poetry!

The History of Literature and its Relation to the Study of Poetry[1]

The precise relation of the history of literature to literature itself has not as yet been determined; even the scope of the history of literature is not definitely fixed. A few years ago the tendency in the study of literature, following the teachings of biological evolution, was to reduce everything in literature, and especially in poetry, to an historical basis; to find the same kind of development in poems that we perceive in organisms; an analogy was read from the field of descriptive science to the field of art, more especially to the field of poetry; principles and methods were transferred bodily.

Nor has the movement been without advantage. First, it has wonderfully broadened our view of the field of literature. Not so very many years ago literature meant, at the most, classical and modern literature; now we know that the poetry of the primitive man is just as much poetry to him as Shakespeare and Tennyson are poetry to us. Without regard to the stage of its development, literature now signifies the entire field and scope of literary expression. Again, the biological analogy has given us something of a method of research. If not the evolution, at least the continuity of literature is seen to be a fact. As in other fields of knowledge, so in poetry, much that we have is to be explained in terms of origin and development.[2] And finally, this analogy has enabled us to reduce to a basis of fact many things formerly left open to subjective judgment and personal impression.

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[1] See Lovett, R. M., *The Historical and Biographical Background in Teaching Literature*. Supplement to the Journal of the Michigan Schoolmaster's Club.

[2] Limited, of course, to the element of fact—the element that can be described.

At the present time there is something of a reaction from this biological analogy. The claims of science, or rather of those who attempted to apply scientific principles and methods to literature, are seen to have been too great. Books beget books, poems beget poems, but not as life begets life. A poem proves to be something essentially different from a tadpole. Influence, development, progress in literature there undoubtedly is, but not evolution. The justification of the division of all that we find in literature and immediately connected with it into an element of fact and an element of value is seen with increasing clearness. Especially is it being seen that the value element is not amenable to the methods of descriptive science. Sensibility or feeling, which is the medium through which we know the value element in poetry, which is indeed the unvariable measure of that value,[1] is being recognized anew as an irreducible element in experience. The history of literature is indispensable to the wider study of poetry, but the development of right feeling for poetry, and of an intelligent appreciation of poetry, is increasingly recognized as an earlier, more difficult, and by far more important task than the study of facts about poetry.

In the high school, an appreciation and a joyous delight in the individual poem; a comprehension of its meaning; a feeling for its emotional tone; an enjoyment of the beauty of its diction, style, and form, are undoubtedly the primary object. But this appreciation opens the way for a wider study of poetry. The perception, not only of similarities in the work of different poets but of differences as well, opens up a study of the way in which each poet's work is moulded by, and gives expression to, his life and character, and how his life and character and his view of life have been moulded by the people and the time in which he lived. No one can become truly interested in the work of any writer without being stirred with curiosity to know something about the man himself, and even about his times. The attainment of precisely the end which the true teacher of poetry sets up for himself inevitably involves new and further problems.

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[1] For all such purposes, the words *feeling* and *value* may be regarded as synonymous. One's feeling with regard to anything invariably represents one's evaluation of it.

How much, then, of the history of literature shall I attempt to teach? quite properly asks the teacher of poetry in the high school. Only the divine gift of common sense will enable one to answer that question. A broad rule, one to be eternally watched and requiring a vigilant eye for special application, may be safely phrased thus: *Get the interest; stir the enthusiasm of the pupil; then carry him just as far as he will go without loss of interest into the facts of the history of literature.* Granted a genuine appreciation, the more historical background the better. The historical element *exists for* the appreciative, finds its ultimate justification in the appreciative, must ever refer to it; helps indeed to broaden and deepen it, to carry it from one poem to another, from one period to another; makes it truer, safer, less personal, more objective.

In general, if one follow the natural method one cannot go far wrong. It is a fact that all those who possess a fine appreciation and a wide knowledge of poetry acquire their appreciation and knowledge in the same way: they enjoy some particular poem; they become curious to know something about the author; they seek to learn the antecedent conditions and the immediate circumstances that influenced him in writing the kind of poem he wrote. They proceed from books to men, from men to periods, from periods to movements in national life. The typical forms of experience which poets express lend themselves happily to such advancement. They are distinctly personal, as in the lyrics of Shelley and Tennyson, and the poetry of Byron; they are national, as in Vergil and Milton, expressive of characteristics, traits, and peculiarities of a people; they are universal, as in Shakespeare, peculiar to no people, but the same in all men, irrespective of race, age, or country, who represent a common stage of civilization. Beginning with distinctly personal experiences, poetry widens its circle, first to an age, then to a country, then to man universal. The cultivated reader, even the pupil who graduates from high school, may not unreasonably be expected not only to have a hearty appreciation of the best productions of the chief English poets, but also to have an intelligent knowledge and understanding of the biographies of authors, something of literary movements and their associated national characteristics, and at least some intimation of the universal appeal of poetry to the heart of humanity.

It is evidently this ideal, under a reversal of method, that has produced some unfortunate results. It is no uncommon practice, or used to be, to begin the study of poetry with a body of facts. The pupil was called upon to recite glibly dates which had no significance for him; names of authors of whom he had read nothing and really knew nothing; criticisms, the justice or accuracy of which he had no knowledge whatsoever. A spurious admiration for the unread masterpieces of literature and an ingrained charlatanism were the inevitable result. The rapturous praising of poetry which the pupil had never read became a tribute to his assumed culture and a token of a pretended intellectual attainment.[1]

Vicious as this method undoubtedly is, the result might have been worse. Under it, pupils often developed into unconscious hypocrites, praising things they knew not of; but they were at least *for* literature, not against it. The very assumption by the pupil of a liking for literature that he had not read carried with it the probability that some day he might read it. He had faith because he did not know and could not understand. If he did not read because the method prevented him, he at least acknowledged the authority of those who should know; he kept his commonplace views in the background; and he paid obeisance to superior taste. In time he doubtless came to have a measure of sincerity in his devotion. He *might* have been a Philistine of a deeper dye. When the worst that can be said against this method has been uttered—and there is much to say—it must still be acknowledged, I think, that there *is* some value in mere lists of books and authors. Many a pupil leaves the high school today a positive ignoramus for the lack of a few pointed lessons on the history of literature.

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[1] If this statement seems strained and unreal to any teacher he is fortunate. In every school where the writer has ever raised the question with pupils: Why do we study literature? there were found pupils who believed that poetry was studied in order solely that they might later pass muster in polite society. In one case the teacher remarked to the writer: "That girl's reply represents her home training precisely."

Under ordinary circumstances, the study of the history of literature in the high school might most safely be confined to biography. But even for the study of biography no invariable rule can be laid down. In some cases the study of the poet's life should precede the study of the poem; in others it should be the last thing taken up; in still others it will be best to consider the poet's life in the course of studying the poems. Of one thing the teacher may feel assured: that the story of a poet's life, well told at the right time, will make a hearty appeal to the class and add to the interest and effectiveness of the study. Don't read it; tell it. Biography is a kind of elevated gossip. It has to do rather intimately with other people's affairs; and there *is* such a thing as a dignified and justifiable interest in this sort of thing. Indeed, it may be through precisely this kind of study that the commonplace taste of many members of the class will be elevated from a desire for mere tittle-tattle to a sympathetic and intelligent interest in people and social events.

In the study of biography, the nearest approach to a guiding rule is probably this: *Teach the poet's life when the study of his poems seems to demand biographical and historical facts for interpretation.* Only as the study of a poet's life increases interest and adds to the significance of poems being studied, ought this kind of work to be taken up.

The type of poem studied affords the chief reason for varying the method. In general, the study of a poet's life should precede the study of lyric poetry. The lyric gives expression to the poet's own feelings. Not only will it add to the interest to know what sort of person it was who had such feelings, but often a feeling can have significance for the reader only in case he knows to whom it belonged. Think of Burns's songs, and you see how true this is. In epic poetry the case is different. The great epic has to do with national themes. The life of the poet, though it may form a significant part of some national movement, is more likely to be submerged in it. The biography then might come at any appropriate stage. In the drama, the poet's life is of still less immediate consequence. It is quite possible to study one of Shakespeare's plays satisfactorily without knowing a single fact of Shakespeare's life. Clearly, the place for biography, when studying the drama, is after the reading of the play.

The order of taking up Browning's poems presented in the preceding pages seems to call naturally for the study of the poet's life somewhere near the middle of the discussion of the poems themselves. After the pupil has read *Home Thoughts, from the Sea; Home Thoughts, from Abroad; Cavalier Tunes; Why I am a Liberal; The Lost Leader;* he begins to ask in class, "Did Browning live in Italy? Was he a liberal? Was he a friend of Wordsworth? Did he resent not being made Poet Laureate?" Then, surely, is the time for taking up the poet's life. Again, after having read *My Star*, *A Face*, and *Prospice*, a real interest in Elizabeth Barrett is created. In two high school classes in Browning the pupils read assiduously long accounts of Browning's life in order to determine whether or not he lived his philosophy. Was he Christian? Was he optimistic? Did he revel in the wild joys of living? Did he fight until old age? Did he make success of failures? How did he meet death?

So, in studying Burns, the pupil will soon feel the need of knowing something of the poet's life. If *To a Mouse* or *To a Mountain Daisy* is read first, questions of what manner of man Burns was and of his life at once arise. Pupils are soon interested in Dorothy Wordsworth, in Byron's mother and the circumstances of Byron's life that tended to embitter his nature, in Tennyson's last days, in Whittier's attitude toward slavery.

It is sometimes advisable to consider different phases of a poet's life at different times. If a somewhat comprehensive study of Milton be undertaken, the period up to 1639 may be discussed in connection with *L'Allegro*, *Il Penseroso*, *Lycidas*, and the earliest sonnets; from 1640 to 1660 may be cursorily passed over; and the poet's later life read in connection with the study of *Paradise Lost* and the later sonnets.

The high school stage is not the stage at which it is expected that one shall come into full possession of an author's work. The teacher who might attempt such a task is now happily imaginary. But even at the high school stage the intimation should be clearly made that no one can really know an author until he has learned all he can about the author's life, his character and motives, his environment, and the national life of which he has formed a part. A systematic study of biography and at least a few lessons on the history of literature will generally convey this intimation. A great deal can be done incidentally by the teacher.

It should never be forgotten that the chief purpose of the study of poetry in the high school has to do with the understanding and appreciating of poems themselves, not with facts about these poems or their authors, certainly not with the judgments of critics. If we wish to cultivate our musical taste, we must hear good music; if we wish to understand and enjoy painting and sculpture, we must see good painting and sculpture; if we wish to enjoy architecture, we must see buildings of artistic construction; if we wish to understand and appreciate poetry, we must read and study poetry, not books about poetry. The teacher who succeeds in bringing home to a pupil some adequate measure of the inherent beauty, delight, and charm of a single great poem, be it *Michael*, *Andrea del Sarto*, *L'Allegro*, or *Macbeth*, has done infinitely more for the pupil than if he sends him out with an encyclopaedic knowledge of the facts of literature from Beowulf to Robert Bridges. The pupil who has, in some adequate measure, been made sensible of the beauty, inspiration, and power of poetry; who has been led to feel the awakening and liberalizing effect of a single great poem; who has learned not merely to talk about poetry in the class-room but to read it with delight in his leisure hours, has learned the secret of literary appreciation. No teacher can bestow a finer gift.

Memorizing

It is well to memorize a great deal of poetry. First, memorizing is essential to true mastery. No one can be said truly to have mastered a poem until he has memorized it;

for truly to know a poem is to know the language of that poem.[1] Change the words, you change the meaning or modify the feeling of a poem, always to an inferior form. Only its own language can successfully intimate the idea or awaken the emotion of a true poem, be it *Andrea del Sarto*, *The Ode to Duty*, or *Macbeth*. The critique, paraphrase, re-statement in other form, are all desirable and helpful in class-study; but each makes a new product; is in no sense the poem itself; is but a part-meaning in a form more immediately familiar, perhaps, but finally always less effective than the poem itself. To have memorized the language of a poem is to have gone a long way toward knowing the poem as it really is.

Something even more important than mastery is gained. Especially at the high school stage is it true that to store the mind with the noble thoughts and the lofty sentiments of great poetry is to repel vulgar and commonplace views, to exert a refining influence upon taste and language, to elevate morals, and to provide in later years an unfailing source of consolation for the disappointments, the disheartenments, and the defeats of daily life.

Discrimination and judgment with regard to what is selected for memorizing must be exercised if an actual aversion to poetry and distaste for it are to be avoided. Clearly, not all poetry studied should be memorized. Some of it is too long; much of it is not distinctive enough in value. Always the relative value of a poem or of lines in it should be taken into account. Extensive memorizing of poetry should certainly be required in high school; for at no stage can poetry be learned with greater facility. Pupils should be allowed some latitude in selecting poems and passages. Perhaps the best plan would be to require a given amount, leaving the pupils largely free to select for themselves. Helpful, guiding suggestions can always be made by the adroit teacher. In general it is well to memorize

(a) Passages that have become the common possession of people of culture.

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[1] Cf. Bradley, *Poetry for Poetry's Sake*.

(b) Passages that impress you as the perfect expression of a great thought or idea.
(c) Passages that reveal some form of refined feeling.
(d) Passages that impress you as very tender and beautiful.
(e) Passages characteristic of the author.
(f) Passages expressive of the subject, motive, or tone of the poem.
(g) Passages that you think you would often feel like repeating through life, to give better expression to your own thoughts and feelings than you could give them in your own words.
(h) Passages that strikingly illustrate certain qualities of style.[1]

No invariable rule for the time of memorizing a poem can be laid down. In a few cases it is well to memorize a poem before studying it in class. Poems, such as lyrics, which give expression to some familar thought or feeling; poems in which pupils find

> "What oft was thought, but ne'er so well express'd;
> Something, whose truth convinc'd at sight we find,
> That gives us back the image of our mind"

will lend themselves best to such a plan. Hood's *I remember, I remember* is illustrative. As a general rule, however, it is best to defer the memorizing until after the poem has been studied in class; it will be best, at least, in the case of all poems not likely to be clearly understood and enjoyed by the pupil, reading by himself.

In the hands of a skillful teacher, memorizing becomes an easy part of the pupil's task, a large part of it being accomplished in the class-room. Before he realizes it, the pupil may have learned much of the actual language of a poem. To accomplish this desirable end, the teacher must insist that, in his replies, the pupil give the exact words of the author, not merely the general idea. Habits of accuracy and precision are the indirect fruits of this mode of memorizing. In the teaching of a poem, the teacher should again and again put such questions as: "What does the poet himself say?" "Quote the exact lines."

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[1] *Cf.* Libby, M. F., *Selections from Wordsworth*, p. 171.

"In what poem that we have studied have you found this idea expressed before? Quote the passage."

After spending four class-hours on *Andrea del Sarto*, students were asked this question: "If some one should say to you, as you walk home today, 'I have just read *Andrea del Sarto*', what line or lines would come to your mind?" The following are passages given:

"I am grown peaceful as old age tonight.
I regret little, I would change still less."

"Ah, but a man's reach should exceed his grasp,
Or what's a heaven for?"

"Love, we are in God's hand.
How strange now, looks the life he makes us lead;
So free we seem, so fettered fast we are!"

"A common grayness silvers everything."

"All is silver-gray,
Placid and perfect with my art: the worse!"

"I often am much wearier than you think."

"My face, my moon, my everybody's moon."

This kind of exercise takes longer to tell about than it does to perform. After such review, the teacher can say, "Quote your favorite five lines from *Andrea del Sarto*", and to the student's own surprise he can repeat them. He has memorized the essential parts of the poem without having to do it as a task.

Memorizing poetry under such conditions as these becomes a very real pleasure. Pupils are always glad actually to "know" a poem that has meaning to them; it is the task of acquiring it that is irksome. Moreover, the pupil knows what he is talking about. Such memory work means more than the repetition of words. Images of a delightful and wholesome character crowd in upon the young imagination of the pupil, and he comes more fully into possession of the poetic experience. At the close of a term, by repeating passages again and again and correlating lines, the pupil will have made one more step toward realizing the full truth of Dante's lines:

> "All
> Are blessed, even as their sight descends
> Deeper into truth, wherein rest is
> For every mind."

The Value of Good Reading

"The desideratum is the education, intellectual and spiritual, especially the latter, without which the mere teaching and training are vain and impotent." "The organs of speech can be brought by intelligent training into complete obedience to the will and the feelings." In these two statements, the late Professor Corson, himself a reader of rare power, has summed up the essential conditions of good reading.[1] Good reading involves a clear and strong intellectual grasp, a delicate and subtle emotional response to idea and feeling, and a control and modulation of the vocal organs that will, with unerring fidelity, reveal the intellectual grasp and the emotional response.

Nothing can contribute more to the study of poetry in the high school than reading, understood and employed in this sense. No test of appreciation is more exacting. Professor Corson would make it the supreme test for examination purposes. "In literary examinations," he says, "whatever other means may be employed, a sufficiently qualified teacher could arrive at a nicer and more certain estimate of what a student has appropriated, both intellectually and spiritually, of a literary product, or any portion of a literary product, by requiring him to read it, than he could arrive at through any amount of catechising."[2]

Interpretative reading of this kind involves certain invariable requirements. In the first place, it must be free from gesture and display. Reading, says Corson, is not acting;

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[1] *The Voice and Spiritual Education*, New York, 1896.

[2] *Op. Cit.*, p. 55. The teacher blessed with a good voice is indeed fortunate. But every one can do something toward improving his voice. Corson's little book will give one practical suggestions. It should be followed by some such book as Sweet's *The Sounds of English*, Oxford, 1908.

and private as well as public readers will do well to lay the statement to heart. All theatrical effects should be studiously avoided. In no way should the reader obtrude himself. He is the living voice between the poet and the listener, and as such he should keep himself and his personal qualities in the background. He should *read very slowly.* In poetry thought is often condensed; connections are often remote; images inherently pleasing in themselves, so that the mind takes pleasure in lingering upon them; even the language is rare and unusual. The effects of these several conditions can be successfully produced only by reading slowly. Then, rise and fall of tone should *indicate the sense.* It should, too, suggest the proper feeling to the listener. It should not only avoid monotony; it should stir anticipation and expectation constantly. Finally, it should make evident the rhythm of the verse. Better to fall into a sing-song than to read poetry as if it were prose.[1] The meter should be emphasized; rhymes should be clearly marked; and even the end of the line, where there is no rhyme, should be indicated by a pause. Good reading makes clear the finer shades of meaning and connection; gives pleasure to the ear through the music of the verse; and stirs the fitting emotion through harmony of tone and meaning.

The ideal method of studying a poem is to have the teacher read the poem aloud first; then to study it critically; then to read it through again. The last reading may often be done exclusively by pupils; more difficult parts may at times best be read by the teacher. Except in the case of very simple poems, readily understood and appreciated by the pupils, it is a mistake to begin the study of a poem by calling upon some member of the class to read aloud. A moment's thought will show that the request is really contradictory. Good reading demands, first of all, that one shall clearly understand the sense of what he reads. But the pupil has not yet studied the poem; he does not understand it. How, then, can he read it intelligently? The request implies precisely the mastery of the poem that the pupil does not possess. In the practical work submitted in this bulletin it will have been observed that, during the class-room discussion, practically all the reading aloud was done by the teacher; it will have been observed also that the last assignment for the pupils, after the poem had been carefully studied in class, was reading the poem aloud. This is as it should be.

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[1] Scott, Wordsworth, Coleridge, and Tennyson all turned their reading of poetry into a kind of chant. Chant—or sing-song—that fails to indicate the sense is, of course, fatal.

Certain almost unsuspected advantages spring from following such a plan. The most important of these is that the pupil enters more fully into the feeling and spirit of the poem than he possibly can under other conditions. It is a fact always to be kept in mind by the teacher of poetry that emotion communicates itself in subtle ways simply through the presence of other people. Every teacher, sensitive to the response of her class, knows how waves of emotion pass over the class from time to time. Every pupil knows, without defining the matter to himself, how much more deeply moved he is by the living voice of the teacher than he is by the dead words on the page. But especially true is it that all forms of feeling connected with art are social in character; they always imply the presence of other people. The class-room, then, instead of representing a highly artificial condition for the study of poetry, represents an entirely natural one; it makes a social unit to be brought into a common state of feeling. Good reading is a very potent factor in bringing about this common state of feeling. If the teacher reads well, she often need do little else, especially with the simpler poems; the glow upon the pupil's face shows that the meaning is clear and that the right emotion has been stirred. And for the pupil, the possibility of winning the teacher's open approval and of stirring the silent appreciation of his classmates is a stimulus to him to enter as fully as he can into the feeling and spirit of the poem. In this way do the teacher and pupil have a truer and deeper joy in what they read than they could have otherwise.

A further advantage is that a motive for reading well is aroused in the minds of the pupils. One reason why pupils, and especially boys, so often read poorly in class is that they feel subconsciously that it is rather foolish to read well. Each student knows that his fellow-students have a book, just like his, open at the same page; let them read for themselves. Something of this attitude is pretty consistently seen wherever the teacher follows the custom of beginning the class-study of a poem by saying, "John, please read the first stanza." Even though John had studied his lesson the night before, he knows within him that he does not really understand the lines and cannot read them well. His respect for the teacher leads him to suppose that, for some reason, she must be right; but he still feels that it is foolish for him to read. Sometimes he has a vague suspicion that the request is made, not because the teacher expects much of him, but simply to "get things going". The result generally confirms John's judgment and point of view. Again the pupil is right, the teacher wrong. But where interpretative reading of the kind I have described is used, all this feeling of artificiality goes out at a stroke. The pupil no longer feels foolish in reading well. The stimulus that he gets from his teacher's reading, and the infectious enthusiasm caught from his classmates, stir in him such natural and delightful feelings that he forgets himself. There is awakened in him the desire, not only to read the poem a little bit better than his neighbor does, but, some day at least, in some measure even "as teacher reads it".

Through good reading, imitation of precisely the best that is to be gained from a poem comes thus to be stimulated in the pupil. The teacher of poetry who has a good voice is blessed of heaven. By this means she can give an inspiration and convey an unspoken encouragement that sink deep with young people who hate to appear in the light of being "directly profited". Intelligent comprehension, deepened interest and enthusiasm, truer and more delicate feelings, favorable forms of competition, commendable imitation—these are among the rich fruits that spring from good reading judiciously employed in the teaching of poetry.

Title and Theme or True Subject of a Poem

The title and the theme of a poem are often not the same. Not all poems, of course, can properly be said to have a theme. Especially true is this of songs and lyrics. There are some dangers, too, in attempting to formulate the theme of any great work of art. "The Story of Perverted Ambition" does not truly represent what there is in *Macbeth*, yet if we attempt to formulate its theme this statement might very well do. Each work of art is, indeed, the *only* true expression of its idea. Yet, since great poems do undoubtedly contain great ideas, it is often a help to try to formulate these ideas as a means of coming into a clearer understanding and a richer appreciation of the poetic value of the poems themselves.

Andrea del Sarto, a man's name and the title of a poem, affords us no idea whatsoever of the theme of the poem. The theme might be variously phrased as, "The secret causes in a man's soul of artistic failure" or, "The conflict in an artist of great skill and promise, between his devotion to his art and his infatuation with a beautiful but heartless and wicked woman" or, again, "The tragic ruin wrought in the life and art of a potentially great man through a destructive infatuation with a beautiful but ignoble woman". But no statement, however true or comprehensive it may be, can adequately represent the poem. The poem differs from the statement just because it is more. Could we effectively reduce a poem or a play to the statement of a theme or to an essay, there would no longer be any use for the poem. The poem is what it is because nothing else can possibly take its place or fulfill its function. Yet the statement of a theme will often serve as a help to a clearer understanding and a richer appreciation than would otherwise be possible.

Oftentimes, perhaps as a rule, the subject of a poem is something that is not in itself inherently poetical. Consider Wordsworth's beautiful little poem, *The Green Linnet.* A green linnet is not, in and of itself, a suitable subject for a poem. What has moved the poet, what has stirred within him the aesthetic experience, is the joy he feels on the return of spring. This is his theme. But it would mean nothing for Wordsworth merely to tell us that he felt a deep joy on the return of spring. That would not move us at all. He must have a carrying medium for his emotion. And he finds an appropriate carrying medium in the image of the green linnet. That, then, becomes the central image of his poem; it is the image about which all others in the poem are grouped. And so the name of this bird becomes a suitable title for his poem. The theme is a different and another thing.

With this distinction made clear, any one author may be made the starting point for the study of other authors. Poems, like the plots of stories, offer few essentially new thoughts; poets represent the old fundamental truths simply from different angles. After Browning has been studied, a tabulation of his principal ideas may be made with line references to poems. When this has been done, other poets can readily be seen to agree or disagree with Browning. The more important ideas can be worked out in class; others can be studied out by the student.

Under this plan, a great amount of reading that students would otherwise not enjoy, yet reading that high school pupils should do, whether preparing for life or for college, can be done with celerity and comprehension in connection with class-work. Four or five days may seem a long time to spend on one poem of Browning's; and yet, with that time well spent, a basis for a great deal of reading that may be quickly done is provided. The recitation on *Ulysses* showed that the students read this poem understandingly. *Prospice* needs only five minutes after *Andrea del Sarto* has been elaborated. If *Rabbi Ben Ezra* has been previously read, Coleridge's *Youth and Age*, Byron's *To a Youthful Friend*, Shakespeare's *That time of year thou mayst in me behold*, Shelley's *Stanzas Written in Dejection near Naples*, Keats's *Ode to a Nightingale*, Milton's sonnet *On His Blindness* may be quickly worked out and enjoyed by the students immediately after *Andrea del Sarto*. In this manner poetry takes on a growing unity; it comes less and less to be thought of by pupils as a chaotic mass of poems. Novels that embrace similar situations may be used as parallel outside readings.

The Study of Verse Form

For purposes of the study of poetry in high school, verse form may consistently be regarded as an essential part of poetry.[1] In order to appreciate individual poems and to understand some of their points of similarity, high school pupils should, accordingly, have a clear understanding of the types of meter and of the chief poetic forms.

The possible intimation that verse form is something extraneous, something superadded to the poem itself by the poet, should be studiously avoided. Many pupils are likely to begin their study of poetry in high school with the preconceived notion that poetry is prose broken up into irregular lines, and this notion may in some measure appear to be confirmed by the fact that, in class-study, form and thought are considered apart. Some special effort may be required, on the teacher's part, to offset this notion. Pupils can be led to see that thought and form cannot in reality be separated. Thought is not thought until it takes form in the mind. It may be possible to state the theme of a poem in prose; but that statement involves the loss of just the emotional accompaniment which makes the poem what it is. The emotional accompaniment can be faithfully rendered only through the form which the poet employs. By apt illustration pupils can readily be led to see that if you change the verse form or the stanza, you change the emotional atmosphere. Form is organic, a part of the poem itself; the greater and more perfect the poem, the more inseparably are form and content woven together.

For high school purposes, instruction in verse form will best be given in connection with the study of individual poems. On occasion, this kind of incidental instruction may be broadened into a somewhat formal exposition. Probably the best plan is to take advantage of some topic which relates to verse and to use that as a means of introducing the subject. The teacher should always watch closely the interest of the class and never carry the discussion in its formal aspects to the point of weariness and dislike. But, skillfully handled, even the discussion of the technical aspects of verse may be successfully introduced on occasion, and the pupil brought to a clear understanding of the different types. There is no reason why a pupil graduating from high school should not have a clear and accurate knowledge of the main types of meter and of stanzaic form.

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[1] It will be advisable, I think, not to raise the question with high school pupils whether it is possible to have poetry without verse, though they can readily enough see that it is possible to have verse that is not poetry. See *The Making of Poetry*, Chapter V.

Poetic Diction

The total effects of beauty and of thought that we gather from a poem do not come merely from the poem as a whole; they come from the parts. The words and phrases of a poem should, whenever possible,[1] be beautiful in themselves and suggest beautiful images; they should contribute something to the thought of the poem; and they should affect the feelings. Poetic diction, with which we can here deal only very cursorily, is, accordingly, a phase of the study of poetry important alike for pupil and teacher.

This is not the occasion to consider the distinctive characteristics of poetic diction, but one or two suggestions of possible helpfulness to the teacher may be made. In the first place, poetic diction is concrete. Very few abstract, general terms will be found in good poetry. Poetry deals with the concrete and the particular, not with the abstract and general. It is for this reason that the diction of poetry, contrary perhaps to popular conception, more nearly approaches the diction of every-day life than does the diction of prose, especially expository prose. Daily life and poetry alike deal chiefly with individual things, not with classes, with the concrete, not the abstract; expository prose deals with abstract conceptions and general terms. Vasari says Lucrezia was faithless, jealous, overbearing, and vixenish. These terms really convey little that is impressive to our minds. Compare with these terms and their effect the actual language of the speaker in even the first four lines of *Andrea del Sarto*, as Browning imaginatively conceived a concrete and particular situation. He makes Andrea say, "do not let us *quarrel—any more—my Lucrezia—bear* with me—*for once—Sit down*—and all shall happen *as you wish*—You *turn your face*—but does it *bring your heart*?"

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[1] *Cf.* the statement by Coleridge, *Biographia Literaria*, p. 149 (Bohn ed.): "a poem of any length neither can be, nor ought to be, all poetry".

Even now we know more than Vasari has told us or ever can tell us. All that lies behind these words, all that is implied, can never be put into language. Who shall exhaust the full content of such expressions as "quarrel *any more*", "*My* Lucrezia", "does it *bring your heart*?" So, too, the expository writer would probably have said that the trees within the convent wall "were grouped"; but the poet says they are "huddled". A glance at any page of poetry will confirm the statement that the diction of poetry is mainly concrete.

Another very important characteristic of poetic diction is its suggestiveness. The great phrases and lines in poetry are inexhaustibly suggestive. The longer one dwells upon them the more one finds; as a man grows older, poetry grows richer. Such expressions as,

> "That unswept stone, besmear'd with sluttish time"

and

> "The murmuring surge
> That on the unnumber'd idle pebbles chafes"

are inexhaustible in their suggestiveness. The inexpressible pathos of Michael's tragic life is compressed into the single line:

> "And never lifted up a single stone".

No one can ever completely unfold it. When Horatio tells Hamlet of the appearance of his father's ghost and says, "It would have much amazed you", and Hamlet, speaking slowly, says, "Very like, very like", years of meditation will never conceive fully all that passed through Hamlet's mind in that single moment or two. The third-rate artist would have had Hamlet *say* a great deal; Shakespeare knew that it was better to use a phrase that would stir thought and imagination endlessly. Poetry is "free"; it uses words and expressions that lend wings to the mind, that liberate it and give it free scope, that carry it on to Heaven's gate itself, and even afford it glimpses of the glory within.

Then again, poetic diction is usually simple. I shall mention just two reasons for this that may be used by the teacher of poetry. In the first place, the simple, Anglo-Saxon, often monosyllabic, words are the first to be learned in life. Words of foreign origin are usually longer, and they are learned relatively late in life. The latter have, in consequence, a much lower emotional accompaniment than have the words learned early in life. *Domicile*, as a word, is just as good as *home; demise* is as good as *death;* but unless it be to indicate a speaker's artificiality, neither is likely to be found in poetry. When the poet wishes to awaken emotion he naturally selects words most likely to arouse it; he selects words which have such associations as will affect the emotions strongly; and these are the words that go back even to early childhood. Shakespeare frequently indicates the difference between genuine and pretended emotion through a difference in language; the sincere character uses simple language, the hypocritical character uses words of foreign derivation. Regan, in *King Lear*, says she is ''alone felicitate'' in her dear highness' love; Cordelia says she will ''love and be silent''. Exeter, in *Henry V.*, recounting with deep feeling the death of York, says:

> "And all my mother came into my eyes
> And gave me up to tears".

All, except two words in this passage, are monosyllabic. The most effective poetic diction is simple diction.

Poetic diction is simple and short for a still further reason: it is more economical for the poet. Whatever the poetic form, the poet has only a relatively limited amount of space in which to express his thought or intimate his feeling. In the case of the sonnet, for example, the poet is definitely limited to a given number of available syllables; there are only fourteen lines, each of a specific number of syllables. It behooves the poet, then, to use the simplest and shortest words available, not only because of the stronger emotional accompaniment that such words have, but because they are short. *Wo* and *overwhelming sorrow* mean precisely the same thing. But to use *overwhelming sorrow*, an expression of six syllables, instead of *wo*, a word of one syllable, would be burning up available space with a prodigality destructive of the artistic end in view.

Mere economy, then, is a further reason why poetic diction should be made up chiefly of short, simple words.

Regarded from the point of view of parts of speech, no words in poetic diction are more important than the verb and the adjective. A moment's reflection will show why this is true. Poetry, we have seen, deals with the concrete and particular; it deals, moreover, with things with which, for the most part, we are familiar. Most of the nouns in poetry represent things familiar in the world about us. The poet presents these things in a new light. And he does so through the distinctive use of verbs and adjectives. Adjective and verb alike express an attribute, a quality, a state, or an action of a thing or person. In the case of the adjective, the attribute or whatever it may be, is *assumed* as belonging to the object, as when Wordsworth speaks of the ''shuddering ivy''. In the case of the verb, the attribute or whatever it may be is *declared* to belong to the object or person, as when the poet says the ''hour steals''. One assumes, implies, or takes for granted the recognition of the connection between ''shuddering'' and ''ivy''; the other explicitly states that there is a connection between ''hour'' and ''stealing''. So Browning says ''*Shut* the money into this small hand''; ''*serpentining* beauty''; ''A common grayness *silvers* everything''; ''My youth, my hope, my art, being *all toned down*'';

> ''That length of convent-wall across the way
> *Holds* the trees *safer, huddled* more inside''.

Poetry, as Aristotle says, deals with the particular in the the light of the universal. Poets do not use distinctive verbs and adjectives simply for the sake of novelty. They deal with common objects of every-day life in such a way as to reveal universal principles. They group things, in the form of images, into new and significant relations. They unfold some measure of the universal law of which each and every thing is a part manifestation. And they do so especially through the effective use of verbs and adjectives. These are the significant *relating* parts of speech. They are the words through which especially the poet is able to signify the new connections among things that he has conceived. Wordsworth and Burns do it with the common things of life; Shakespeare does it with man; Milton does it with the supernatural; but each unconsciously uses the same method; he reveals what he has to say principally through the distinctive use of verbs and adjectives.[1]

What the verb or adjective is to the noun, the metaphor and simile are to the poem as a whole. Verbs and adjectives, indeed, very largely make up the life of the metaphor and simile: the two are very intimately connected. A suggestion or two may be of help. In the first place, any possible notion that, by the use of metaphor and simile, the poet "decorates" simple things for the sake of effect should be broken down. Pupils should, by every possible means, be led to see and feel the naturalness, even the inevitableness, of poetry. But they may easily become confused. While studying a poem they are impressed by the peculiar effectiveness, let us say, of a simile. But when they attempt to use a like simile in their composition they are told it is bad style. No wonder they feel beaten back and forth! To avoid such confusion they must see that the great end of prose, especially expository prose, is clearness; and that the chief justification for the use of a simile in prose is to add to the clearness. In poetry, on the other hand, they must see that the great end is the arousing of elevated and refined feelings; and that the chief justification for using a simile is to contribute to emotional suggestiveness. In each case the figure of speech is the same; but the use of it is essentially different. Poets do not "decorate" their poems with figures of speech.

Figures of speech mean, chiefly, the illustration of the unfamiliar or the unknown in terms of the known. Few of us, for example, have seen the sea. But we have all seen a man plough; we have watched with interest as the soil curls up and rolls over from the ploughshare. How shall the poet enable us to get his idea, with its due emotional accompaniment, when he wishes to tell us about a vessel on the sea? He says, simply, "the ship *ploughs* the sea".[1] He does not do that for effect; he does it so that, at once, he may convey an idea and awaken feeling. None of us has seen Wordsworth's "Lucy"; but we may know her as she really was, because we have all seen:

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[1] The importance of this idea for the teacher of poetry in the high school can, it seems to me, scarcely be overemphasized. To dwell especially upon the verbs and adjectives in poetry is in general to dwell upon the significant combinations effected by the poet. And to enable the mind of the pupil imaginatively to comprehend these new combinations, to help him actually to realize them in his own consciousness, is to elevate that consciousness from the plane of mistaken conceptions, false ideals, and untruth, to the plane of universal law. It is to transform temporarily, it may be, but still for the moment to transform, the boy whom we may know simply as "Tom Smith" into a part of universal humanity. No task is more difficult to achieve, none could be more worthy. In the successful accomplishment of it, in the pupil's joyous attainment of it, lies all there is or ever can be in the teaching of poetry.

"A violet by a mossy stone
Half hidden from the eye!
—Fair as a star, when only one
Is shining in the sky."

So great is the significance of the metaphor and the simile in the study of character that a further word must be added. I do not hesitate to say that there is no more certain unfailing indication of what makes up a person's inner character, of what consistently engages his mind, than the metaphors and similes he uses. Naturally, this is so. For in endeavoring to make the less familiar clear, one turns inevitably to what he best knows; he dips for his material into the well-springs of his personality. What he produces, then, comes from his inmost heart, from the essence of his personality. With all their consummate cleverness, the most able villains in Shakespeare are still unable to avoid this trap. Addressing Laertes, the King in *Hamlet* need use only one figure, indicating his conception of the service of Polonius to the state, and we know him for what he is:

"The head is not more native to the heart,
The hand more instrumental to the mouth."

One such flash from the poet's pen and we know the king for a physical-minded man, an eater and a drinker. Had Desdemona known the significance for character of figures of speech, she might have averted the tragic ruin that fell upon her and her lord at the hands of Iago. Iago has a mind like a sewer; the images that he uses come from no other source; what he talks of is consistently illustrated, made more familiar, in terms of obscenity. But because he had unction; because of his suavity and grace; because Othello thought he was honest and his friend, this unfailing indication of real content and purpose of character was overlooked, and both Othello and Desdemona went down to a ruin as tragic as it was unnecessary. Even the clever Rosalind unwittingly gives token of her disguised sex when she says, telling Orlando where she lives: "With this shepherdess, my sister; here in the *skirts* of the forest, *like fringe upon a petticoat*", for no man accustomed to live in the forest would ever dream of using such a figure. It sprang from a woman's inner consciousness.

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[1] Figures of speech, of course, wear out in time; they become trite. In one sense, all language is metaphorical.

Why Study an Evil or Failing Character?

On first thought, it strikes one as somewhat anomalous that the finest and deepest moral effects produced through the study of poetry should come through the study of evil and failing characters. But, anomalous or not, a moment's reflection convinces one that it is so. Not the perfect characters but the imperfect and evil characters make the deepest appeal; make, indeed, any kind of effective appeal to our imagination and to our moral sense. Macbeth and Lady Macbeth, Brutus and Julius Cæsar, Hamlet and Ophelia, Othello and Iago, Satan in *Paradise Lost*, Lancelot and Guinevere, the Duke in *My Last Duchess*, Andrea del Sarto and Lucrezia: all are evil or failing characters, failing rather than inherently evil, no doubt, if we see deep enough,[1] but all alike lacking in precisely those moral qualities which a study of their characters consistently inspires. Why is this?

In the first place, the study of an evil or failing character, artistically presented, calls forth a series of standards in terms of which that character is said to be evil or to have failed. To judge an act as evil or deficient is necessarily to have a standard according to which the judgment is made. If we could not perceive what Macbeth *ought* to have done we could never know that he did wrong; if we could conceive no ideals of which Andrea and Lucrezia fell short, we could find nothing to condemn in their lives. But Shakespeare makes it clear, if it need be made so, that Macbeth should never have killed his king; and Browning lets us know that Andrea should never have sacrificed his art for an ignoble woman. Each character is so presented by the artist as to make it reasonably evident what the implied ideals are. These intimations of ideals the reader catches and groups together in imagination into a conception of an ideal character.

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[1] All the greatest poets, Shakespeare especially, make it evident that ignorance rather than inherent viciousness and degeneracy of man is the fruitful source of error and tragic waste of life. This conviction, consistently implied by the teacher, especially in teaching drama, will be found to have a very real, however subtle, effect upon pupils.

And there the pleasure lies. Not in what the poet gives us but in what he enables us to do for ourselves do we find delight. Just as the child prefers the rag doll to the doll fully equipped, so the reader prefers the evil or failing character to the perfect character. Each affords more room for the play of imagination. The child does not play with the rag doll; she plays with her imagination; the doll is simply a concrete starting point; the child's imagination joyously calls up images of what the doll is conceived to be—baby, mother, grandparent. The bold outlines of the figure, the lack of detail, leave the imagination unchecked in its play. So the reader of a poem or play does not want a perfect character. That would leave his imagination nothing to supply. He wants the outline, chiefly a negative outline, that will enable him to build up a conception of a character for himself. ''Always'', if I may quote words that I have used elsewhere, ''no matter how perfect in some respect the poetic representation of a thing or person may be, there must be some occasion, some room, for the play of the imagination; there must be some opportunity for the reader to construct for himself, to supplement, to add, to supply almost endlessly out of his own experience; always he must be left free to do more for himself than the poet does for him; and yet to do something which, without the poet's aid, he could by himself never effectively attain''.[1]

But the reader does more than this. He does something more than find ''On the earth the broken arcs; in the heaven a perfect round''. In the moment of his aesthetic pleasure he

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[1] *The Making of Poetry*, p. 173.

becomes in imagination the ideal which he has conceived. Let us see how this comes about.

''All the standards which any one makes use of . . . are but reflections of his own potential self; they are a part of himself. A standard of feeling, of thought, or of action which any one holds, is something to which he regards himself as at least potentially capable of rising; it is, in the truest sense, a reflection of himself. . . . It is this ideal self that each reader or spectator becomes. So long as he remains in an aesthetic attitude, so long as the flash of pleasure and delight lasts, he actually becomes his ideal and potential self; he *is* that self which he ideally conceives. The ideal of himself, so vainly and ineffectually pursued in the world of dust and action, suddenly becomes, in imagination, both real and present. The experience may last but for a moment; in any case it must be very short; but for that sweet moment he has held himself at the high level where is

' . . . the most difficult of tasks to *keep*
Heights which the soul is competent to gain'.

In consciousness, in mind and soul, not in reality, not in the world of action as yet, he *is* for the moment his ideal self.''[1]

The study of an evil or failing character, artistically portrayed, results, then, in the finest moral effects possible through any medium or form of activity. It enables one actually to attain in imagination ideals of character, blurred, dimmed, lost sight of, amid the struggles of daily life or the din of the market-place. This indeed is, in part, the very meaning of poetry to us. Adolescents especially are constantly making and unmaking their ideals of character. The ideals conceived are practically determined by the influences under which the child comes at this formative period. If these influences are inspiring, the mind of the boy or girl is moved toward a fine and lofty idealism; if they are commonplace or base, the mind is dragged down. It might seem as if the type of character to be studied in poetry, in order to attain the better end, would be a character which embodied all the virtues of life. But it is not so. No type of character is more efficacious in producing desirable moral effects than the evil or failing character, presented under artistic conditions and in accordance with the laws of art.

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[1] *Ib.*, p. 168. On the full significance of this, both for the individual and for society, see *The Making of Poetry*, Chapters VI and VII.

Possible Application of a Poem[1]

In poetry, as in other things, we find what we bring, receive but what we give. The pupil who acknowledged that the study of poetry in high school meant to her a preparation for polite society, simply brought to her study some of the artificial ideas of her home life. Many pupils are only a little less unfortunate. To some, poetry is simply a school task, irksome and annoying. To others, it is a rather unreal thing, pleasant enough to read and even study, but having no very vital connection with life itself, especially with the lives of persons about us as we see them from day to day; it has to do with the far-away, with the remote and the ideal; if it is not precisely something with which to "animate an hour of vacant ease", it is not at least very intimately related to life.

No small part of the task of the teacher of poetry consists in breaking down these false and artificial conceptions, and in helping the pupil to replace them by others more worthy. Poetry becomes a living reality to the pupil, broadens his experience, liberalizes his mind, helps to save his soul indeed, in large part as he comes to conceive worthily of poetry: not only to feel its beauty but also to see that it has practical bearings upon every-day life, that it is a reflection of life, a representation of its eternal laws and of its enduring ideals. Morals can be treated in this way as in no other; for the truth of moral questions is accurately perceived as those questions are seen in the light of aesthetic conditions. Not that poetry should be made didactic and that the teacher should assume the attitude of a moralist; poetry should teach *while* it delights, and the teacher will accomplish most by *not* assuming the attitude of the moralist.

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[1] Because of the dangers involved, this section is offered with some trepidation. It should never be forgotten by the teacher of poetry that *the value of poetry is always contained in the experience to which the poetry itself gives rise*, not in some possible moral or practical application of it. If a teacher sees from the glow of a pupil's face that a poem has satisfied the imagination; if she is assured that the pupil's imagery is true and vivid, and his feeling "right", she will do well to let comment and attempted application go. But before she can satisfy the imagination of a pupil, she must often reduce the elements of the poem into terms of the pupil's experience. This may involve going far back into a pupil's life; it will almost certainly involve the asking of many questions, and the calling out of comments to provide for differences in the types of imagery and for varieties of experience among pupils. When the appropriate imagery has been brought into the foreground of imagination, the attempt to bring the pupil into a full enjoyment of the poem should be renewed. The teacher of poetry has constantly to work back and forth from imagery to appreciation, from appreciation to imagery. The end of all study of poetry is *the poetic experience*. Any means that is economically helpful in bringing about that experience for the pupil is entirely justifiable. Each teacher must herself be judge of occasions, ways, and means. What is done in these sections is merely suggestive, as many other parts of such a bulletin must be.

Such questions as, "Have you ever met an Andrea del Sarto in real life? Can you recall one from history? Have you ever seen any one evidently capable of doing fine things who gave them up and let them go for the sake of something that really dragged him down? Did you ever know a very bright pupil who let his study go for the sake of sport or of social life?" bring home to the pupil the theme of the poem with a revealing power of vivid reality. In teaching *Saul*, "All's love, yet all's law" can be made the occasion of an incidental discussion on some laws of physiology and of mental and moral health through which the pupil is much more likely to see the evils of bad habits than he would through a straight lecture on cigarette smoking. Don't preach. Stir a hatred of evil because evil is ugly,[1] and the morals of your pupils will take care of themselves. See clearly that an appreciation of poetry is a more valuable equipment than a code of morals. A teacher of English soon comes to know the strength and weaknesses of the boys and girls in her class. By a look, a comment, a question addressed now to this boy, now to that girl, she can, without any resentment on the part of the pupil, stimulate the acceptance of higher standards of thought and conduct. Boys and girls at this stage are forming their conceptions of the biggest things in life. They resent being preached at; but no one sees the truth as revealed in great poetry more quickly than they do; and, with few exceptions, no one is more willing or anxious to live these conceptions.

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[1] *Cf.* Palmer, *The Field of Ethics*, p. 93: "Every one of us finds moral ennoblement in the presence of beauty. . . . A power expulsive of evil resides in the beauty we have been contemplating, and sweeps us away from that pre-occupation with self which is the root of vileness. . . . *If I were a father and were sending my boy from home, I should tremble at his departure if I knew that he had no regard for beauty.*" The italics are mine.

Nor does the teacher always have to draw the conclusions. Read *Andrea del Sarto;* then read *Ulysses;* and the pupils will set up their own ideal at once. Read Wordsworth's *To My Sister*, or Browning's *My Star* or *Prospice* immediately after *Andrea del Sarto*, or institute comparisons among these poems, and no lectures on real womanhood are needed. The discussions that arise from *Rabbi Ben Ezra* will do more to make the students realize that riches do not mean success than forty lectures on service by the preacher. Such discussions require tact, sympathy, and a quick appreciation of the lights and shadows in the pupils' faces. But the consequent remarks overheard in the corridor or the street, snatches of conversation, phrases in themes, as well as the moral tone, deportment, and conduct of pupils,[1] show with what happy frequency the seed has fallen upon fertile ground. It is the realization of being this kind of sower that brings real joy to the life of an English teacher.

Composition and Literature

The study of poetry has little to do directly with prose composition. We read poetry for enjoyment; we seek to understand and appreciate the great masterpieces of literature. We read prose, usually, to get information; sometimes we study it for the sake of form. Though the study of poetry will doubtless elevate our diction and refine and cultivate our feelings, it is best, on the whole, to study poetry without much reference to composition. The place and function of poetry differ essentially from the place and function of prose, especially expository prose.

Yet it is possible occasionally to connect the study of poetry with work in composition. Themes constitute a very important part of an English teacher's work. Often the chief difficulty is in finding a motive to write. It may not be amiss to show here how short papers may at times be satisfactorily used in connection with the study of poetry. Short papers are of great value. Their restricted form practically forces the pupil to express himself with special care; and they are a practical aid to the teacher in that they may be quickly read.

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[1] Every teacher should read Jastrow's little book, *The Qualities of Men*, Houghton Mifflin Co., Boston and New York. That sensibility is the measure of the man is the theme.

A series of short papers followed the study of *Andrea del Sarto.* Among the topics were: "Was Lucrezia the Cause of Andrea's Failure?" and "My Idea of Success". Short sketches of the lives of the four painters mentioned in the poem were written and illustrated by pictures taken from art catalogues and by the Perry Pictures. Such papers grow naturally out of the pupil's experience and knowledge and compel him to organize ideas that might otherwise be vague and fleeting. Two of the papers written are submitted:

WAS LUCREZIA THE CAUSE OF ANDREA'S FAILURE?

Lucrezia was not the cause of Andrea del Sarto's failure. He failed because he lacked in will power, fortitude, and ambition, the most essential things in the making of a great man.

Andrea did not have enough will power to overcome the temptations that he met in life. He showed this when he stole the gold entrusted to him by King Francis. He shows it, too, when he says:

"In this world, who can do a thing, will not;
And who would do it, cannot, I perceive:"

Andrea tells his wife that, with her help, he might have done better work and accomplished more. But if he himself had possessed more fortitude; if he had not depended on others to help him; if he had taken the battle of life upon his own shoulders, he would have accomplished more than if he had had three women to encourage him.

Then he lacked ambition. At Fontainebleau he had a chance to succeed and become another Raphael, but he would not even finish the work he had started. His refusal to grasp such an opportunity shows a character too lacking in ambition ever to become famous in any work. The same lack of ambition is shown when he says:

"I feel he laid the fetter: let it lie!"

Andrea's was a plain case of a man who could have done something but would not. And he knew it. He blamed Lucrezia for his failure, but that failure was due entirely to himself.

MY IDEA OF SUCCESS

> My idea of a successful life is one in which a man can be happy in old age. To be happy he must have some high ideal to strive for, watch his actions and make truth his steady aim. He must think not only of public fame, but of how he can help his fellowman. He must be master of his passions. He must not be envious of anyone that is raised by chance to a higher place. He must make his conscience his strong retreat. Although he may not be an owner of lands, he will own himself, and while he seems to have nothing, by being happy he has all.

Outside Reading

At the high school stage, pupils should do a great deal of outside reading. Many authors, like Dickens and Scott, if not read at this time, are likely never to be read at all. In general, all material assigned for outside reading should be much more simple than the material read in class. Often the mistake is made of assigning for outside reading poems fully as difficult as those read in class. The ideal list is one that begins with poetry and prose of a kind that boys and girls delight in without urging or much explanation, and proceeds by almost imperceptible gradations, year by year, until the mind can understand and enjoy such great works of art as *King Lear* and *In Memoriam*. Beginning, let us say, with Scott and Campbell in poetry, and Stevenson and Brontë in prose, one could pass on to parts of Byron, to Longfellow, and the simpler poems of Tennyson; thence to the light comedies of Shakespeare; and finally to the more serious things of Browning and of Shakespeare. To fail to plan some such course of outside reading for the four years of high school life is to miss one of the great obvious blessings of this most important period. Such a course is not only ideal; it is entirely feasible, even easy. All that is required is that the necessary books be available—a matter now of very little expense—and that the course be carefully planned.

The motive for doing this outside reading should be not merely the inherent interest of the material itself but the interest awakened in the class-room. The test of outside reading is that it shall lead not only to more reading but to better reading. One high school boy, I remember to have heard, had read all of Henty's fifty-odd books. But he failed to go on to Stevenson, and never read a line of Meredith or of Hardy. Outside reading should represent means of growth, intellectually and emotionally, as well as means of mere entertainment. Whether it affords means of growth is the real test of its worth. It should never be difficult enough to repel pupils, yet it should have substance enough to enable the youth to stretch his mind a little.

An effective means of getting this motive to work is to assign for outside reading some of the more difficult poems of an author, after the pupil has been safely launched in the study of that author and has gained some intelligent, guiding conceptions. After reading several of Browning's poems carefully in class, pupils will read with avidity such a poem as *Christmas Eve and Easter Day*, especially if the teacher tells the story in advance. We all love a story, but boys and girls at the high school age are especially responsive to a story well told. Often this task of telling the story of a poem in advance can be delegated in turn to the more capable pupils. That the best pupils can read a poem in advance and give a good account of it is a helpful guarantee to others that it can be done successfully by pupils as well as by the teacher. Incidentally, the pupils who are selected to tell a story get some excellent practice in organization of material and in oral delivery, and the others are stirred with a spirit of emulation to be put in the selected class. The requirement to be made in giving an account of a poem, play, story, essay, or whatever it may be, is this: Give such an account of this piece of literature as you would to one unfamiliar with it whom you wished to interest in it and have read it.

A great deal of this kind of work can be done incidentally. Pupils should be stimulated to go beyond the prescribed list. No teacher can ever tell when a seed may strike fertile soil, and it *may* spring into fruits richer by far than those forced into growth in the heat of the class-room. Not so much what pupils read in class as what they read out of class sinks deep into their lives with shaping and formative influence. The supreme test of the class-work of any teacher of literature is:

What do your pupils read in their leisure hours? The mind can be driven in the class-room; it can be forced to learn things; but that is not life. The real life of the mind is seen in what it does in a voluntary and unconscious way. It is to reach this real life of the mind through the means of class-instruction that the teacher of literature should constantly strive. Only as this end is attained is the teaching of literature truly successful. And so it will be well constantly to give informal aspects to the work. "Did you ever read *The Cloister and the Hearth* by Charles Reade? You haven't? Well, don't begin it in the evening, for if you do you will sit up all night to finish it." "If any one of you boys has not read Stevenson's *Black Arrow*, he has missed a ripping[1] story." "If any one of you girls has not read Brontë's *Jane Eyre*, she has missed a most interesting story." "There's a fine poem to read." These and like statements made by the teacher from time to time will be the means of stimulating pupils to read a great deal that they would otherwise miss altogether. Occasionally it will be well to take an hour off just to read something to the class. Don't fear that you are losing time; you are probably gaining it. What you are dealing with after all is life, not poetry. You probably accomplish least when you work hardest with conscious aim and purpose. Try, for example, Tolstoi's masterly little story, *The Long Exile*. It may take twenty minutes, but it may start some pupil reading, too, and bring him for the rest of his life under the spell of Tolstoi's inspiring idealism. Who that loves literature does not recall, with pleasure and delight, hours when the teacher took a period off just to read something to the class? Who that teaches literature does not know that these were hours of soul-stirring effect, when many a class-hour's work was dull and lifeless?

Library facilities are often very poor, but in these days of cheap books a great deal can be done with even a few dollars. Give lists of books to the pupils; group books suitable for each class on a special shelf in the library; stimulate pupils to buy books for themselves; bring to the attention of individual pupils books suited to their needs or tastes; as frequently as possible hold five to ten-minute informal exercises in which pupils tell of the most interesting book, poem, or play they have read in the past month; post lists, prepared by pupils, of the books read each month by each class; make the class-requirements in the way of reports and note-books as informal as possible, otherwise you are likely to deaden the interest; give evidence yourself of a lively, sympathetic interest in what is being read, and you will be surprised at the amazing amount of material that even pupils with the reputation of being dull and lethargic can be induced to read.[1]

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[1] Is it necessary to say that the use of slang by the teacher of English especially is in general to be studiously avoided? Yet many a boy will be stimulated to read something simply through the teacher's occasional use of his own language.

Sight Work

An admirable exercise in the study of poetry is the use of sight work. To be able to tell a poor poem from a good one without help of any kind, without knowing even the name of the author, is to be able to read poetry with true understanding and genuine appreciation. Tastes differ, "the doctors" differ; but there are poems, even of a simple kind, of unquestioned worth and beauty. To have pupils pick these out from others, even to have them pick out lines and phrases of special beauty, is a most helpful exercise in the study of poetry, and one, moreover, that pupils find exhilarating and enjoyable. In this way pupils soon get rid of the idea that a teacher or any other person who knows good poetry has some hidden secret in his art; they come to see that the only means of coming to know good poetry is to read good poetry, to steep oneself in it until one is able to recognize intuitively its distinctive quality.

A special stimulus may be given to this work by framing such a question as the following: If it were necessary to select one of the following poems for publication on the ground of poetical merit, which one would you choose? One of them is nonsense.

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[1] See *Report of the Committee on Home Reading*, National Council of Teachers of English, 68th Street and Stewart Ave., Chicago.

Also, *Books for Boys and Girls Approved by the Brooklyn Public Library for Use in Its Children's Rooms*. Published by the *Brooklyn Public Library*, 1911. If it is not out of print, a copy will be sent on request.

Also, *List of Text Books, English Classics, Reference Books and Supplementary Reading* authorized by the Board of Education for use in the Public Schools of St. Louis. Compiled by J. A. Long, Supply Commissioner, January, 1909.

(a) Orpheus with his lute made trees,
And the mountain-tops that freeze,
Bow themselves, when he did sing:
To his music plants and flowers
Ever sprung, as sun and showers
There had made a lasting Spring.

Every thing that heard him play,
Even the billows of the sea,
Hung their heads, and then lay by.
In sweet music is such art,
Killing care and grief of heart
Fall asleep, or hearing, die.

(b) How happy to defend our heart,
When Love has never thrown a dart!
But ah! unhappy when it bends,
If pleasure her soft bliss suspends!
Sweet in a wild disordered strain,
A lost and wandering heart to gain!
Oft in mistaken language wooed
The skillful lover's understood.

(c) He saw alone the star that lured him on,
And with his rapt eyes turned from earthly ways,
He followed where that astral wanderer shone,
Illumined, yet illusioned, by its rays.

Blame not his errant feet, that idly fell
On more than one poor flower in passing by:
Enough to know those wandering feet as well
Smote stone and flower alike unconsciously;—

Enough that we, who dream amid the dust,
Were wakened by his momentary flight,
When down our calmer ways was blown a gust
Of song that woke reverberating Night.

Ah! happier treaders of earth's lower ways,
Who pace smooth paths with less impetuous beat;
Since he would climb where ye can only gaze,
One moment pity his impatient feet!

Other typical questions that may properly be asked in connection with sight work are as follows:

1. Give a suitable title to the poem.
2. In a single sentence, state its theme.
3. State concisely the substance of each stanza.

4. In one paragraph, give an outline of the thought contained in the poem.
5. Simplify the expressions you find obscure.
6. Make a list, with brief comments, of the more significant or striking words of the poem.
7. Point out passages in which the music of the verse seems to accord with the subject-matter in an especially happy way.
8. Describe the verse form.
9. Pick out passages suitable for memorizing.
10. The poet's imagination is constantly finding analogies or similarities between the world of mind and the external world; seeing deep truth in the world of nature; illustrate from the poem given you.

Dramatization and Other Means of Cultivating Interest

In recent years dramatization has taken a prominent place in connection with the study of poetry in the high school. Dramatization has its advantages; it has, too, its disadvantages. It is an excellent means of enforcing a study of historical background. For a knowledge of costumes, manners and customs, sports and pastimes, prevalent in a period, nothing will effect more than dramatization. Not infrequently, too, the unimaginative pupil, dull and apathetic in class, will become vitally interested in what he is studying when he is given an opportunity to act out some part. Moreover, it should never be forgotten that a great deal of the poetry we study deals with scenes and situations with which most of us are unfamiliar. Many passages in Wordsworth can mean little to a boy who has lived all his life on the plains, or to a girl who has never seen a lake or a mountain. At the best, any poem on the skylark can mean little to one who has not heard the wonderful song of that little bird. Ways and means, accordingly, must often be devised whereby poetry shall take on the necessary touch of reality. Dramatization is one of these. If the grotesque and farcical elements of attempted dramatization can with reasonable success be eliminated; if pupils, even while they enjoy themselves, can be induced to make an earnest effort toward truthful representation; dramatization can be made an effective aid to the study of poetry. Words accompanied by action take on fresh meaning for those who attempt to represent their content; and for those who do not act, a further help toward clear visualization of imagery and comprehension is usually gained. Judiciously and discreetly handled, dramatization may be made a very real aid in the study of poetry in the high school.

The chief disadvantage and the chief danger is that teacher and pupils alike may come to mistake dramatic representation for the study of poetry itself. At its best, dramatization is only a further motive for study; it may be little more than an interesting kind of activity suggested by a poem or play. In studying *Andrea del Sarto*, for example, it would be quite possible to stimulate an imaginative realization of Browning's meagre suggestions of scene and situation by having the scene represented by pupils. But apart from getting the lines memorized by those who compete for a place—and there always should be competition—it is to be questioned whether the result would justify the effort. There is a mistaken notion abroad in the land that we enjoy only what we see and hear. The notion is an offshoot of an unconscious kind of laziness. Perhaps the most energetic people, we Americans are yet imaginatively lazy. We hate to use our imaginations. We want our books and our newspapers, even our short stories, profusely illustrated. Pure description we will not read. A play must be put on with the last detail of realistic presentation; nothing must be left to imagination. But this is all or half wrong. The barrenness of the Elizabethan stage forced writer and audience alike to "work their minds", and they got more out of the play in consequence than we do. They were like the child with the rag doll. All they needed was a starting point, and they revelled in the glories of the imagination. Dramatization in high school, involving, as it does, a great deal of work on the part of teacher and pupil, often involves an expenditure of time and energy quite disproportionate to the pedagogical advantages gained. Properly started and stimulated, the average high school pupil will get more real enjoyment out of seeing things in his mind's eye than he will from having them somewhat crudely presented before him. Ultimately the teacher's task lies more in stimulating imaginative activity than it does in planning dramatic presentations.

Dramatization of plays is, of course, the most justifiable of all efforts of this kind. In the teaching of Shakespeare especially, the teacher should remind the pupils constantly that the plays were written to be acted, not primarily to be read. Constant reference to the stage, and a stimulus toward imaginative realization of what an actor would probably do, are often a very great help. Suggestions of this kind can be made the more effective when there is the prospect of actual presentation to conclude the study. But even more helpful, perhaps, as a means of aiding the pupil to a full and rich realization of what a play is, is to have him do some original work himself. Any pupil who has ever attempted to write a single scene for a play, however simple, will from that time have not only a deeper respect for those who wrote great plays; he will have also an insight into the conditions essential to the making of a good play that no amount of instruction could ever impart. There is even a further gain. To the average high school pupil, a great deal of literature is likely to smack of artificiality. It seems to him an unreal, almost an unnatural thing. Some first-hand attempts at composition will do a great deal toward removing this erroneous impression. Many a pupil, through a few exercises of this sort, may have his mind cleared of notions against which even an able teacher would have to struggle, and struggle in vain, for months, perhaps for years.

Just as there is a certain kind of dramatization that may be effectively used in high school work, so there is a certain use that can be made of actual objects referred to constantly in poetry. *The Chambered Nautilus* will forever take on a different meaning once the pupil has seen the shell of a nautilus. The study of practically all poets can be vitalized and made more interesting through the judicious use of objects. A twig, a leaf, a bud, brought to class will often give the right start to the study of a nature poem. A like use may be made of pictures. A set of the Perry Pictures[1] is almost invaluable for illustrative purposes, and the cost is very small. Here as before, however, it is well to keep in mind that the concrete thing presented to the eye is but an aid to imagination. It is but a starting point for fuller, richer, and truer visualization than would perhaps be otherwise possible. The more nearly we duplicate the imagery that was in the author's mind when he wrote, the more nearly we shall understand his language and appreciate his poem. With the fundamental imagery wrong, it is idle to talk of understanding or enjoying poetry. No time is ever wasted, no amount of effort is too great, to ensure as near as may be a duplication in the child's imagination of the imagery that stood out before the imagination of the poet. This done, other things will largely take care of themselves. Yet it is entirely possible that one may, through unfortunate choice of poem or some other unfavorable circumstance, spend so much time in getting a motive for the study of a poem and in stimulating an imaginative realization of its imagery as never to arrive at the poem itself. Once more the teacher's problem resolves itself into a question of judgment and common sense.

Review and Examination Questions

One of the most helpful means of bringing pupils to a satisfactory stage of preparation is the use of review questions. For those teachers who still believe in examinations—and what better safeguard against loose and slovenly work in literature has any one yet found?—nothing can be much more helpful, both for teacher and pupil, than the preparation of a thoroughly comprehensive set of review questions on all the work done, with the emphasis thrown upon points brought out in class.

Experience has shown that pupils take up with the scheme eagerly. Instead of being left to flounder amid a mass of seemingly endless material, they have a definite basis for review.

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[1] Lantern slides are still better. Nothing is more effective as a means of giving pupils a background for the study of the poetry of England. Good slides can be obtained at a shilling each from Newton and Co., 37 King Street, Covent Garden, London, W. C., England. The cost of a lantern unfortunately precludes the use of slides in most high schools.

They review with much greater confidence than would otherwise be possible. The teacher's assurance that the examination will be based directly upon the questions given is a further stimulus for work. Incidentally, the teacher shifts much of the responsibility to the pupil, where it ought, under right conditions, to be. The teacher need have no apprehension about drawing some of the examination questions verbatim from the list, and of basing others directly upon it.

Giving out review questions of this kind makes scarcely any appreciable change in the class grades, except that two or three are above the line who would otherwise be below; but the significant fact is that *the class as a whole learns just about twice as much as it would if left to plan its own reviewing.* The results in actual knowledge are double what they are likely to be under any other plan. Moreover, every one comes from the work in a better frame of mind. The pupil glows in his inner consciousness with a fine sense of mastery and of obligation satisfactorily performed. The examination has left no brown-paper taste in his mouth; he still likes poetry. There has been a fairness in imposing this task upon him which is happily in accord with the ideals set up in the study of poetry in class: the teacher seems to aim at living what she teaches; poetry *has* something to do with life, even in an unsuspected quarter. Even the dullard acknowledges that his failure is "all his own fault". How can he do otherwise? Every one was assured that, if he could answer the questions in the review-set, he could pass the examination; the questions were based on the work done in and out of class; there can be no excuse for any one. It is the weak pupils who always make the trouble at the close of the work; by this means the teacher may free herself of a series of troublesome problems.

In order to give some idea of the character of question that might satisfactorily be used, I shall submit a few typical questions on *Andrea del Sarto;* the type of question that pupils who took part in the exercise presented would be expected to answer:

1. State the circumstances under which Browning came to write *Andrea del Sarto.*

2. What does Andrea's name literally mean?
3. Who was John Kenyon and what was his relation to the Brownings?
4. In a single sentence, state the theme of the poem.
5. In one carefully written paragraph, give a short description of the character of Andrea; the same for Lucrezia.
6. Give a careful description of the place where Andrea and Lucrezia are when the poem opens.
7. Name some of the painters mentioned in the poem. Mention one painting by each. Give a very brief description of it.
8. What is the verse form of *Andrea del Sarto*? How do you account for the colloquial effect of the language?
9. Quote ten consecutive lines of the poem.
10. State clearly the ideals of life that Browning brings out in this poem, referring to passages and situations in support of your statements.
11. What is Browning's doctrine about imperfection? How does he seem to justify it, both for this life and for the next?
12. Locate the following passages, indicating the part of the poem (or naming the poem, as it will be in some cases) from which they are taken; give the general connection; and explain very carefully all words or passages in italics:

> (a)"My face, *my moon*, my *everybody's moon*,
> Which everybody looks on and calls his,
> And, I suppose, is looked on by in turn,
> *While she looks—no one's.*"

Such questions are only typical. Each teacher can readily make out a set adapted to the class and to the poetry studied. It will be entirely safe to mark certain questions, such as nine and twelve, as certain to appear on the final examination. This further assurance is stimulating for the best pupils, finally condemnatory of those who fail. There is absolutely no excuse for any pupil who does not know something when he has been told that it would be asked on the examination. Question twelve is the type of question that always draws the line of distinction between the best pupils and the others. All the questions given for review or for examination fall naturally into two groups: those which involve specific, definite, and accurate information; those which involve a knowledge of more general matters, such as the theme or problems of a poem. The average student will answer the second type satisfactorily, and he will answer some part of the first; the best student only is able to answer both types of question satisfactorily.

Experience shows that this scheme, under proper administration, never leads to difficulties. It may look like giving the whole situation away in advance, but such a notion arises from inexperience or from a wrong notion about examinations. Why should the teacher want to keep *anything* back before examinations? The value of the examination lies principally in the systematic review which it enforces; beyond that it effects little. Any plan which will double the results from that review is to be desired; any plan which will even do away with much of the mental distress incident to the examination period is to be desired; but a plan that will relieve the teacher of burdens of responsibility; that will help to keep the relation between the teacher and pupil cordial; that will permit the pupil to leave his class dominated by an unavoidable sense of fair play; that will, above all, send him out equipped with twice the knowledge and appreciation that he might otherwise have, is a plan that no teacher can well afford to neglect. It may not work for all, but in the plan outlined I believe there are the possibilities of such a working scheme.

The Enjoyment of Poetry in its Relation to Hard Work

The true enjoyment of poetry and hard work go hand in hand. Popular conception, in and out of school, is likely to be to the contrary. Everybody reads; everybody is in some sense a student of literature; and the end sought by all is immediate pleasure, free from effort. And there is such a thing as a kind of pleasant and harmless browsing on the hillsides of literature; there is a kind of literature that yields a mild, narcotic pleasure; there is even a kind of poetry that comes near the class of push-pin, bowling, and golf; affords a mild tonic of mental recreation; and produces a pleasing forgetfulness of one's creditors and of the stings of the world. With just these conceptions the high school pupil may come to his task. He may think that he must find immediate pleasure in everything he reads. If poetry is something to be enjoyed, there should be no hard work; tasks should be easy, assignments light. Moreover, the teacher's aim to produce pleasure through poetry seems to endorse the view.

But this popular conception of the study of poetry is, of course, wrong. Poetry is not froth, nor is it yet the fumes of wine. Its end is pleasure; but the pleasure is of the kind that comes, in all worthy poetry, only after effort and hard work. *The true study of good poetry demands a higher and fuller exercise of our faculties than any other pursuit or activity.* Most pursuits and activities, science, business, and the like, appeal but to one side of man's nature; poetry appeals to the whole man, involves the whole man. Poetry is a discipline, intellectually and emotionally, as rigid as science; it demands nicer moral discrimination than man is called upon to exercise in any other sphere of activity; it sets standards of action to which man, in his daily life, consistently fails to attain. The pleasure of poetry is refined and elevated. It differs from the pleasure of the soda-fountain or the moving-picture show; it cannot always, like these, be gathered by the casual passer-by, even as he plucks the obvious berry on the bush. Were it not so, *the study of poetry in the high school could not be justified.* We *work* in order to gain a high pleasure. We work because we cannot gain that high pleasure without work. The true enjoyment of poetry demands effort, steadiness of purpose, sometimes even pain, to achieve it. Learning, said Aristotle, is painful; and the adage is true even of poetry. Not that pain of mental effort and hard work should be deliberately sought out by the teacher, of course; pupils are not necessarily learning anything, or growing in power, or deepening their enjoyment merely because they are working hard. But they cannot grow in power; they cannot win heights of higher pleasure in poetry; they cannot come to know good poetry for what it really is, without effort and hard work. The true enjoyment of good poetry lies beyond the hills of effort.

Some of the reasons why this is so have already been glanced at. That the experience—thought, feeling, or action—dealt with by the poem commonly lies beyond the present attainment of the pupil is itself sufficient cause for work. Time and effort are needed to grasp the true poet's conception. But even this can be done only after one has understood the poet's language; and that language, we have seen, is rare and unusual. The poet expresses his ideas in novel and distinctive ways. Then, the poet's language is emotionally suggestive. Even the man rich in experience cannot fathom or exhaust the lines of the great poet. The longer he dwells upon them, the more he finds. What he finds is not merely what is directly expressed; it lies between the lines. In all great poetry, more lies between the lines than in the lines themselves. And it is there that the true reader finds most. He discovers images, finds thoughts, catches feelings, gathers intimations of action for which there is no definite token in the language of the poem; yet all this is there; it is the "unexpressed content" of the mind of the poet, the unrevealed part of the poem that possessed his mind as he wrote; it is not a mere reading in from without. To catch the poet's conception, to understand his language, to read between the lines in poetry takes time, effort, hard work.

But there are certain more special reasons why the true enjoyment of poetry is inseparable from hard work. To begin with, mere remoteness in time means increased difficulty in reading. The further back one goes, the greater becomes the task of rehabilitating the language of the poet; of finding, not our meaning, but the poet's own meaning in the word he used. To understand accurately what the poet says, the historical setting must, in some measure, be reproduced. Manners and customs were perhaps different in his day; many words carried a meaning even opposite to what they now carry; life was viewed from a different angle. Shakespeare's plays contain thousands of references, commonly in the form of figures of speech, to a sport long since obsolete—hawking; and often, to know what Shakespeare says, is to know the practices of hawking. To read Pope aright, to understand and enjoy, for example, his *Rape of the Lock*, one must know the social and literary ideals that animated that period, so different from our own. The delights of Chaucer, his unexcelled portraiture of character, his sly irony, his subtle humor, all must be lost to any one unwilling to go through the effort of mastering the elements, at least, of the English of that day. Historical remoteness means work, if we are to read our poets with intelligent understanding.

Then, poets are commonly learned men. If they are not always scholars in the academic sense of the word, they do know a great deal about a surprising number of things. Gray is said to have been the most learned man of his day. Milton knew his Bible and his classics so well that he referred to characters, situations, and ideals in them with as much familiarity and facility as the modern boy reels off the names of the members of his baseball team. And so it takes work, and hard work, too, to master in class a poem like *Lycidas* or *L'Allegro*, as any teacher who has tried it knows. Sometimes, as in the case of Browning, much of the learning is highly specialized. Browning deals primarily with men and women. But his men and women differ from the men and women of Burns and of Wordsworth. They are specialists, painters, sculptors, artists of one kind and another. And often, as in the case of our class-exercise, one must know something about these people, not merely as types of humanity, but as specialists, in order to understand Browning's poetry. Not to have this information is often to be repelled in the outstart. Similarly, much of Tennyson's poetry must be dead to one who knows nothing about the classics. That poets have wide knowledge, often highly specialized knowledge, involves work, even hard work, for the high school pupil.

Involved in this attempt to rehabilitate the historical conditions of a period and to become familiar with the poets' wider range of knowledge is a further demand. He who reads poetry with understanding and appreciation must escape from himself, must break away from the narrow and conventional ideas that dominate his every-day actions. If he reads Wordsworth prompted by the aim of finding something that will help him in advertising, he will never, of course, really understand and appreciate Wordsworth. Incidentally, he will probably miss the truth in advertising. The poet's view differs from that of the average man. It is free from considerations of self-interest, immediate service, use, and ownership. It is higher, truer, more worthy. And to see it and grasp it involves a self-abandon, a sympathy, and an imaginative realization of image and idea that can come only through a lofty and elevated kind of effort. It is no easy task to come into full sympathy and appreciative understanding of the life and expression of a people remote in time from our own, one inspired by different national and social ideals. Nothing is more difficult for the mind that is undisciplined.

Yet just there the task lies. To understand and enjoy the poetry of another people, the true reader *must* get beyond the petty circle of his own life. He must see life through the eyes of the people whose poetry he reads. No other line of study, no other kind of activity, makes so wide and varied demands as does the study of poetry. It is not sufficient, as in science, to have proved that an idea is true or false; one must know where it comes from. We hear a good deal these days about culture; we are even told that if we read poetry we will get culture. In the minds of many people, this kind of culture suggests pretty ways of speech, or good clothes, or weak vertebrae. The most distinctive mark of the cultured mind is the ability to take another person's point of view; to put oneself in another's place, and see life and its problems from a point of view different from one's own. To be willing to test a new idea; to be able to live on the edge of difference in all matters intellectual; to examine, without heat, the burning questions of the day; to have imaginative sympathy, openness and flexibility of mind, steadiness and poise of feeling, cool calmness of judgment, is to have culture. No study, no kind of activity contributes as much towards the attainment of this state—this capacity for "other-mindedness"—as does poetry. Grossly as the statement that the study of poetry gives culture is misunderstood and misapplied, it is profoundly true. But it is the kind of internal culture that cannot be bought by the yard at the haberdasher's. National aims, conceptions, and ideals; ethical values; types of emotional experience; ends of practical achievement—these it is the true reader of poetry, even the pupil in high school, must in some measure apprehend, understand, and make his own before he reads poetry with understanding and enjoyment.

The final reason why the high enjoyment of poetry involves work is the deepest of all. To enjoy poetry is to know life on its best side, and to know life is the last result of supreme effort. It is the highest type of knowledge. High school pupils can be expected to make only a start in the deeper knowledge of life, and yet if they are to make a start at all they must put forth effort; they must do some hard thinking, gain new types of emotional experience, conceive higher ideals of life and conduct. To read poetry aright, to win its finest pleasures, to come into the satisfying knowledge of what is best in life, the mind of the pupil must be kept active, keen-edged, and tense. The serious study of Shakespeare, that which seeks the highest pleasure, will quite properly result in an occasional headache. No poetry truly worthy of the name reveals its secret of joy without time and effort. Not one reading, not even twenty, may suffice. Songs we may except again, perhaps. Time and effort, and that of the highest order; strong and clear grasp of intellect; play of feeling; judgment in morals; gathering up of memories; grouping of impressions; reshaping and projecting of ideals, are all involved in the arduous task of the true study of poetry. Poetry is an expression of life. To know poetry is to know life. No knowledge is more worthy; none more difficult to attain. The laws of personality are inscrutable; they operate imperceptibly. In comparison, the laws of physical and biological science are relatively simple. Science is the attempted description of that side of life which is primarily physical; art is the *only* adequate representation of the activities of the inner life. Poetry is a revelation of the laws of personality; it deals with the inner life of man, with the laws of his being. Only through repeated readings, through the gradual mastery of some of the fundamental things in life, will many a poem unfold its secret.

Not until then will it afford the high enjoyment, the elevated and refined feelings, which it was designed to produce.

If the serious pursuit of poetry involves effort; if to gain high pleasure from poetry there must be hard work, how much, then, the teacher of poetry in the high school may properly ask, should I actually undertake to read? It is difficult, if not impossible, to say. Much depends upon the teacher, upon the enthusiasm, interest, and eagerness for the study of poetry she is able to inspire. The best year that the writer spent in the study of poetry in high school was spent on just thirty-six of Wordsworth's poems, ten of them sonnets. The best days were those on which the teacher read a line of a poem, laid down his book, and led an animated discussion for the hour. As the truth and beauty of some profound idea was gradually unfolded, the scales of partial blindness fell from our eyes; inviting areas in life, hitherto unguessed at, were opened up; worlds undreamt of were happily discovered. But there was hard work. Every line, every word, was discussed and worked over again and again; every poem in the book was memorized; the examinations were the hardest in the school. Yet enthusiasm for literature ran so high in that school; there was such a ready response in bringing up assignments, that other teachers had a task to get their work done. Many a pupil here got his ''start'' in poetry; some went on to the writing of it; others to the teaching of it. In another school that recently came under the writer's observation the three-hundred-odd pages of Matthew Arnold's selections from Wordsworth were read in three weeks. In such a case the mere number of poems seems to ensure defeat in the main aim. To the writer, the list prescribed for ''college entrance requirements'' seems excessive, if the best results are to be obtained. In the *Circular of Information to Accredited Schools*,[1] published by the University of Missouri, is an outline of a course in English, part of which is devoted to literature. This will be some guide. Preparation of pupils, equipment of libraries, the demands of those ''higher up'', and other varying conditions make it impossible everywhere to seek to accomplish a uniform amount of work. Of one thing we may be sure:

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[1] To be obtained by applying to the mailing clerk.

haste is waste. Better a little well done than quantities read superficially. Some intensive reading, much rapid, general reading, might be the rule. To go galloping through the ages is to get only a blurred view of the literary landscape. In reading poetry, to fail to take time to apprehend the poet's thoughts and to experience his emotion is to miss the end of all the study. Better to read one book or one poem in a year, and do it thoroughly, than to read a hundred carelessly and superficially. Not the reading of many books but the manner of reading a few makes the difference between true study and false study. What I have quoted Ruskin as saying, in the beginning of this bulletin, seems to me to be entirely sound.

To understand what great poets say and to enjoy what they offer means effort and hard work. But it is a kind of effort and hard work that brings deep satisfaction. It is a fundamental mistake to read only that which is immediately pleasant to us. Sustained effort, hard work, habits of thoroughness and accuracy will themselves help to contribute a lively interest to the study of poetry; self-indulgence, the pursuit of an immediate sensuous pleasure, mental habits of laxity and superficiality, will finally kill not only immediate appreciation, but all the finer kinds of feeling which poetry, rightly studied, invariably yields.

Poetry and the Teaching of Poetry

To teach poetry is to add to the enjoyment of life. Poetry has one great central theme: the happiness of man; and poets have one common object: to share with their fellowmen the joys they find in life. Poets aim at affording a refined and elevated kind of pleasure. They discover and unfold unsuspected values in life. They offer consolation in sorrow, fresh hope in disheartenment, an added joy to happiness. As they sharpen the edge of tragedy in life, they deepen our sense of what is good. Poetry develops man's mental and spiritual nature. It awakens him to what life really is; brings into fuller clearness his relation to the world; extends his intellectual horizon; cultivates and refines his sensibilities; broadens and steadies his moral nature. It opens up an ever-widening path of progress. It begins precisely where life falls off and fails; completes its partial achievements; reconciles its failures; carries it on to successful issue; and reveals the grounds of true success in a concrete way by presenting the inevitable and necessary ends of conduct. Poetry is a storehouse of wisdom. Through it one may come to know life for what it really is. With greater assurance of success than one can well have otherwise, one may arm himself for the battle of life. Poetry offers to man a permanent possession of an ever-present and easily-accessible source of loftiest stimulus and highest enjoyment of all that is best in life.

To teach poetry is to pass on to others something of this best in life. It is to be the living voice for what the poet says. It is to be the humanized form—faintly, imperfectly, it is true, but still of necessity the humanized form—of what poets contribute to life. All that is best in life is the poetry of it. To understand and appreciate poetry is to understand and appreciate life on its best side, nothing less. To teach poetry is to clear the path and open up the way for those who do not know and have not seen the best there is in life. It is to throw the searchlight of truth upon the highways of thought and character. It is to reveal the true ends of living, the chief values in life. It is to unfold the beauty of the commonplace and in the life of man. It is to study the patterns of what life may be and ought to be. To teach poetry is to help the growing and developing mind more truly to understand life; to be alive to its realities and its opportunities; and to perceive its capacity for affording refined and elevated pleasure. It is to enable such a mind temporarily to realize in imagination unsuspected ideals, undivined forms of feeling, desirable kinds of action, eternal types of moral value. In a smaller and fainter way, to teach poetry is to do with poetry what poetry itself does for life: add to the joy of living.

BIBLIOGRAPHICAL NOTE

A bibliography, especially pedagogical, will be found in Carpenter, Baker and Scott's *The Teaching of English*, Longmans, New York, 1907. For list of books suggested for a high school library, see *Circular of Information to Accredited Schools*, published by the University of Missouri. The following list, chiefly non-pedagogical in character, is intended to be merely suggestive to the teacher. For the sake of convenience I have listed some books and essays as indispensable, others as recommended:

I INDISPENSABLE

Arnold, M.,	*The Study of Poetry.* In his *Essays in Criticism*, Macmillan, New York. $1.50; also introduction to Ward's English Poets, Vol. I, $1.00.
Butcher, S. H.,	*Aristotle's Theory of Poetry and Fine Art*, Macmillan, New York. $4.00. The essays by Professor Butcher are especially helpful. All literary criticism may be said to go back to Aristotle.
Coleridge, S. T.,	*Biographia Literaria*, (Everyman's Library) Dutton, New York. Especially chapters IV, XIV, XVII, XVIII, XIX, XXII. 35c.
Lessing,	*Laocoön.* Translated with preface and notes by R. Phillimore. Routledge, London; Dutton, New York. 50c. Another translation by E. C. Beasley. Bell, London, 3/6.
Mill, J. S.,	*Dissertations and Discussions.* The chapter, *Thoughts on Poetry and its Varieties.* Routledge, London, 50c; Dutton, New York. New Universal Library, 1/. Almost everything that Mill has written is worth reading.

Shelley,	*A Defence of Poetry*, in *Essays and Letters*, Walter Scott, London. 1/.
Sidney,	*The Defense of Poesy*, edited by A. S. Cook, Ginn, Boston. 65c.
Wordsworth,	*Preface to the Second Edition of the Lyrical Ballads.*
	Preface to the Edition of 1815, with the Supplementary Essay. In any complete Wordsworth. Edited by Knight, Macmillan, New York. $1.50 vol. Also, *Wordsworth's Literary Criticism*, edited by N. Smith, Oxford Press, American Branch, New York. 75c.

II RECOMMENDED

Barbe, Waitman,	*Famous Poems Explained*, Hinds, Noble and Eldridge, New York, 1909. $1.00.
Bates, Arlo,	*Talks on the Teaching of Literature*, Houghton, Mifflin & Co., Boston and New York. $1.30. Chapter eight is especially valuable.
	Talks on the Study of Literature, Houghton, Mifflin & Co., Boston and New York. $1.50.
Beeching, H. C.,	*The Study of Poetry*, Cambridge University Press. 2/. Brief but good.
Bennett, Arnold,	*Literary Taste and How to Form It*, Doran & Co., New York, 1910. 75c.
	Suggestive in many ways. Contains a list of essential books, called An English Library, divided into four periods.
Bradley, A. C.,	*Oxford Lectures on Poetry*, Macmillan, New York. $3.00. One of the most important lectures, *Poetry for Poetry's Sake*, is also published in pamphlet form and sold for 35c. Oxford Press, American Branch, New York.

	Shakespearean Tragedy: Hamlet, Othello, King Lear, Macbeth. Macmillan, New York. $3.25. Indispensable to any one who is teaching Shakespeare.
Bright and Miller,	*The Elements of English Versification*, Ginn, Boston. 80c. Brief and elementary.
Butcher, S. H.	*Some Aspects of the Greek Genius*, Macmillan, New York. $2.50. The chapters, *The Written and the Spoken Word*, *The Unity of Learning*, and *The Dawn of Romanticism in Greek Poetry*.
Corson, H.,	*The Aims of Literary Study*, Macmillan, New York. 75c. Very suggestive.
	The Voice and Spiritual Education, Macmillan, New York. 75c. Should be in the hands of every teacher of poetry.
	A Primer of English Verse, Ginn, New York. $1.00. Deals with verse chiefly in its aesthetic and organic character.
Dowden, E.,	*New Studies in Literature*, Houghton, Mifflin & Co., Boston and New York. $2.25. The chapter, *The Teaching of English Literature*.
	Transcripts and Studies, Kegan Paul, Trench & Co., London. $2.25. The chapter, *The Interpretation of Literature*.
Encyclopaedia Britannica,	Article, *Poetry*. Cambridge University Press.
Emerson, R. W.,	*Essays*, Second Series, *The Poet*. Crowell, New York. 60c.
Fairchild, A. H. R.,	*The Making of Poetry*, Putnam's, New York, 1912. $1.50.

Hazlitt, Wm.,	*On Poetry in General*, In Hazlitt's *Works*, 3/6 each, or *Hazlitt on English Literature*, by Jacob Zeitlin, Oxford Press, American Branch, New York. $1.50.
Hunt, Leigh,	*An Answer to the Question 'What is Poetry'*, edited by A. S. Cook, Ginn, Boston. 50c.
Hyde, Wm. DeWitt,	*The Teacher's Philosophy in and out of School*, Houghton Mifflin Co., Boston, New York and Chicago. Riv. Ed. Mon. 35c. Has nothing directly to do with poetry, but no teacher can afford to neglect this little book.
	The Five Great Philosophies of Life, Macmillan, New York. $1.50. A fuller statement, worth while to any teacher.
Mackail, J. W.,	*Lectures on Poetry*, Longmans, Green & Co., New York. $3.00.
Palmer, G. H.,	*The Ideal Teacher*, Houghton Mifflin Co., Boston, New York and Chicago. Riv. Ed. Mon. 35c. Just as important and valuable as Hyde's little book.
	The Field of Ethics, Houghton, Mifflin & Co., Boston and New York. $1.10. Especially the chapter, *Ethics and Aesthetics*. An admirable little book, very helpful in giving the teacher a background for work, especially on moral questions.
Santayana, G.,	*Interpretations of Poetry and Religion*, Scribners, New York. $1.50. The chapter, *The Elements of Poetry*, is well worth reading.
Sweet, Henry,	*The Sounds of English*, Clarendon Press, Oxford. 2/6.
Tisdel, F. M.,	*Introduction to English Classics*, Macmillan, New York. 90c. Contains an outline of English literature and questions on the chief classics studied in high school.

Verity, A. W.,	The Pitt Press Shakespeare for Schools, Cambridge University Press, Cambridge, England; Putnams, New York. 40c each. Practically all the plays commonly read in high school have been edited. A particularly excellent edition.
Winchester, C. T.,	*Five Short Courses of Reading in English Literature*, Ginn, Boston. 50c. May be of help in suggesting readings.
Woodberry, G. E.,	*The Appreciation of Literature*, Doubleday, New York, 1907. $1.50.
	Heart of Man, Macmillan, New York. $1.50. Contains *A New Defence of Poetry*.

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AN EXPERIMENTAL STUDY OF METHODS OF TEACHING HIGH SCHOOL GERMAN

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AN EXPERIMENTAL STUDY OF METHODS OF TEACHING HIGH SCHOOL GERMAN*

The purpose of this paper is to report some experimental work done in the University High School, on the methods used and the results obtained in the first year's work in German. Since the methods used in this work are related, more or less, to others which have been in general use in the teaching of modern languages, a brief description of some of these methods will precede the report.

I.—METHODS USED IN TEACHING MODERN LANGUAGES

EXPOSITION

Probably one of the first of the methods to be used in teaching a modern language was the **Grammar Method**, which is simply an adaptation, or an imitation, of the method so long used in teaching Greek and Latin. According to this method attention is given from the first to the formal side of the language; paradigms and rules and exceptions are memorized apart from any connected reading or conversation in the foreign tongue. When this study of grammar has been completed, the students are allowed to read, but even then the reading is made a basis for further drill in grammar. Composition is also used mainly for grammatical purposes. Careful analysis and translation are required and, as a consequence, the amount of reading done is very small. The foreign language is not spoken and pronunciation is not considered important.[1]

The **Natural Method** is a result of a reaction from the abstract grammar study according to the **Grammar Method**. Its aim, evidently, is to teach the new language in a way similar to that by which the mother tongue is acquired. The method is oral in character, at least until considerable familiarity with the idiomatic spoken language is attained. In its extreme form it consists of conversations between teacher and pupil in the foreign language—the use of the mother tongue is not permitted. At a comparatively late period reading is begun, and, at a still later period, the study of grammar. The material for composition is taken from the oral work of the class.

Another oral method used in modern language teaching is the **Psychological Method**. This method is often called the **Gouin** method also, from the man who originated it, and sometimes the Betis method, from the man who brought it into general notice. The term **Psychological,** implies at least this much of its general character, that it is an attempt to adapt the teaching of the language to the commonly accepted methods of mental development. The basic principle of the method is that of association of ideas. Each lesson is presented orally and consists of a group of short idiomatic sentences closely connected in thought. Sometimes objects are used to illustrate. The students are expected to form a distinct mental image of each thing or idea presented. From day to day these groups are connected until finally a more or less complete speaking vocabulary is supposed to be mastered. Throughout the course most of the talking is done by the teacher, although the pupils are continually asked to repeat what has been said or to answer questions. Thus it would seem that pronunciation was not considered very important.[2] Reading is postponed until most of an ordinary vocabulary has been acquired, but instruction in grammar is begun early in combination with the other work. Composition is based upon work done orally in class.

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* A master's thesis submitted in the graduate division (School of Education) of the University of Missouri, 1910. The original copy with the acknowledgments is on file in the library of the University.

(1) Committee of Twelve, Report, p. 14.

The next method to be considered is variously known as the "New" method, the "Reform" method, and the "Phonetic" method. For the sake of convenience it will be called here by the last name, **Phonetic.** As it is variously known, so is it variously described, but there are some ideas, the main ones concerning the method, common in all descriptions. The method is the result of a reform movement, started in Germany in 1881 by Professor Viëtor of Marburg, against contemporary methods of teaching modern languages.

According to Direktor Walter (of the Musterschule, Frankfurt-on-Main) some of the main ideas for which Viëtor and his followers stand are: Emphasis upon the living spoken language rather than the dead letter; the teaching of grammar inductively in its true nature as an abstraction of the language and therefore subordinate to it; the use of the phonetic science in teaching pronunciation.[3] The major emphasis, then, is given to the spoken language, and the principal aim, evidently, is to acquire a practical use of it. The instruction begins with a training of the ear and the vocal organs, and with drill upon the various sounds. Later, texts are used, usually in phonetic transcription at first. A systematic study of grammar is not taken up until a late period, though this phase of the language is studied inductively earlier. Translation comes last.

(2) Report of Committee of Twelve, pp. 21-22.

(3) Taken from a quotation in Bagster-Collins, pp. 3 and 4. Die Reform des neusprachlichen Unterrichts auf Schule und Universitat, Walter, Marsburg, 1901.

The fifth and last of the methods to be considered is the **Reading Method,** the title of which so far explains itself that further description is hardly necessary. The controlling aim of this method is to learn to read the foreign language quickly and easily. The reading of connected texts is begun at once and much sight translation is used. Grammar and composition are considered merely as helps to reading and are treated as such. According to the Committee of Twelve, pronunciation in the Reading Method receives little attention, and there is little or no oral or written use of the language.

These, then, are some of the methods used in teaching a modern language. No doubt there are many others, most of them, however, modifications or combinations of those mentioned. One in particular —a modification of the pure grammar method—by which an attempt is made to teach grammar in a more inductive way, is very largely used. Since this method is one of the two used in our experiment, a fuller description of it will be postponed until later. The remainder of this portion of the paper will be devoted to a criticism of the methods already described.

CRITICISM.

In criticizing any method, its aim must be kept in view. A method may be very good for one purpose and yet quite inadequate for another. A method adapted for high school students must take into consideration not only the maturity of the students but also the two general classes into which they are divided, in our country at least—the larger class, perhaps nine-tenths, who will never go beyond the high school even if they complete that, and the other class, who will continue work in college or university. Probably all would agree that for the larger class the emphasis should be upon the concrete or practical phases of the work. These, because of greater interest, will make a more lasting impression and become a more permanent possession. For the students who will continue their work in higher institutions, a knowledge of the more formal technical side is of more value than for the former class. Since the average high school class, however, includes both kinds of students, the needs of both must be kept in view. Bearing this in mind, the methods may be criticized.

For the **Grammar Method** certain advantages have been claimed. It was thought to be of great value on account of the mental training involved in the drill. This doctrine of formal discipline, however, is no longer generally accepted; formal training in any one study is no longer made a pedagogical aim. The method may, perhaps, give training of some value in purely philological work, but it has so many disadvantages that this one possible advantage is almost lost sight of. Aside from the fact that pure grammar study, especially with an extremely limited vocabulary, is not likely to inspire interest on the part of high school students, the method is based upon a false idea of the nature and function of grammar. That grammar is really a series of classifications and deductions made by scholars concerning the living language, and not a number of abstract rules in accordance with which the language is constructed; that it is thus only a means by which we may be guided in a systematic study of the real thing, the language, and is not an end in itself—these facts do not seem to be recognized in the method. In this respect it may be compared with the old methods of teaching the sciences, by which the real things considered came in as an after-thought, if at all; the main attention was given to studying classifications and generalizations about them. Fortunately along with the changes in science teaching has come a change in modern language teaching. The grammar method in its original form is rarely found. But it is probable that too much emphasis is still given to grammar as an end.

In contrast to the grammar method the **Natural, Psychological,** and **Phonetic** methods are all good in that they are a reaction from the formal, lifeless study of the language. They treat the language as living, and are thus more likely to inspire interest. In the hands of capable and especially trained teachers who could speak the language fluently each of these methods no doubt would prove successful, especially in giving a practical command of the language.

But there are several reasons why they do not seem adapted for use in our high schools. In general, the teachers are not prepared, either naturally or by education, to use them. If the teachers were so prepared there would still be other objections. Each of these methods emphasizes too much its one principal aim to the neglect of others, and in each the aim seems to be practical rather than cultural. In Germany it may be, and probably is, most desirable that the student of modern language—of French for instance—emphasize the ability to speak the language, but with us, living on another continent, there may be other aims more desirable. As Bagster-Collins says, the majority of our students will never have occasion to speak the language but they can always have pleasure in reading it.[4] It is not meant to imply by this that the oral use of the language should be neglected, but that speaking the language should not be for us the leading aim, as it seems to be in the methods under discussion. According to these methods reading is delayed until too late a period when we consider the students who stop after one or two years of high school work, or at least at the end of the high school course. It may be added, that the **Natural** method is not necessarily ideal, **just because it is natural.** It must be remembered that the child takes years to acquire even an imperfect knowledge of the language he is using and hearing constantly. What then of the new language which, at most, the student can use and hear only a small part of the time? That he can learn it as he has his own is, as Sachs says in an article on modern languages,[5] "a flagrant impossibility". As for the Psychological method, in the form outlined, its failure to emphasize pronunciation sufficiently is a defect even from a psychological point of view. Its underlying aim, however, should be kept in mind in all good methods.

The **Reading** method, as described, is also too one-sided in its aim. It is probably successful in giving its students the ability to read quickly and easily, but perhaps superficially also. It is doubtful if there could be real literary appreciation with a knowledge of the language such as would be thus obtained. Then, by merely reading and translating with little attention given to pronunciation, and by never getting into any orderly system facts concerning the language which are learned incidentally, a student is not prepared in the best manner for more advanced work he may wish to take in college.

It may be concluded, then, that although each of these methods has its good points—and some of them are excellent when judged from the point of view of their particular aims—no one of them alone seems satisfactory when judged from the point of view of the needs of the ordinary high school classes of our country. The Grammar method, in its original form is too formal, too abstract and mechanical to be at all suited to the interests of high school students anywhere, and this alone is enough to make it unsatisfactory. The **Natural, Psychological,** and **Phonetic** methods, are unsatisfactory as regards amount of time left for reading, and the **Reading** method, besides the danger of superficial work, does not sufficiently prepare its students for more advanced work in the language. The problem arises, then, as to how these disadvantages might be overcome by improvement in method. How shall the language be taught in the first year so as to insure a knowledge of the grammar, at least in its essentials, and yet not give this study undue emphasis; how attain as much ability as possible during this year in the use

(4) Bagster-Collins, The Teaching of German, p. 22.
(5) Sachs, Julius, Modern Language in Secondary Schools. Educational Review, vol. 29. p. 168.

of the spoken language and yet not make this the chief aim; how acquire an easy reading knowledge of the language, and yet not be superficial; and finally, how adapt the year's work to the interests of the high school students—these were the questions kept in mind in the following experiment.

II.—THE EXPERIMENT.

Before describing the methods used in the experiment, some information should be given regarding the conditions and the material with which we worked. These facts will concern the students, the teachers, and the amount of time spent.

The students were divided into five classes as nearly uniform in size as possible. No attempt was made to apportion them as to age, ability, preparation and the like—they were simply allowed to enter the classes most convenient for their schedules. Moreover, care was taken that changes from one section to another should not be made, unless it might be from one section into another in which the same method was being used, and even these changes were limited. The only change, then, except the few which will be mentioned in specific cases, was that caused by students dropping in this way at the opening of the second semester. It is probable, however, that this change did not affect the work to any greater extent in one class than in another. The facts which concern the sections and the students individually—facts which should have, it would seem, some bearing on the work done—will be given as briefly as possible in the following table. It may be said here, however, that, of the five sections in first year German, three were what will be called Reading sections—Sections II, III, and V below—and two, Grammar sections—I and IV below.

TABLE I

DATA CONCERNING THE STUDENTS

SECTION I

Students by Number	Age	Years of Latin	Times Absent	Application
1	17	0	2	Good
2	23	2	0	Very good
3	15	0	5	Good
4	22	3	2	Good
5	21	1	3	Fair
6	16	0	3	Very good
7	12	0	0	Weak
8	16	0	0	Very good
9	17	0	2	Very good
10	14	0	0	Very good
11	17	0	1	Very poor (dropped)
12	17	0	1	Very good
13	14	0	4	Uncertain
14	16	0	0	Good
15	14	0	0	Good

SECTION II

Students by Number	Age	Years of Latin	Times Absent	Application
16	14	0	1	Fair
17	18	3	7	Indifferent
18	16	1	0	Rather Slow
19	12	0	12	Fair
20	20	0	0	Very good
21	18	3	1	Frivolous and careless
22	18	0	0	Serious—earnest
23	14	0	0	Excellent
24	16	0	1	Excellent
25	15	0	0	Very good
26	18	0	1	Listless and inattentive
27	18	2	3	Serious but poorly prepared
28	15	1	1	Good but has outside work

SECTION III

Students by Number	Age	Years of Latin	Times Absent	Application
29	15	0	0	Indolent—careless
30	18	1	1	Very poor
31	18	2	2	Poor
32	17	0	2	Uncertain—backward
33	15	0	2	Very earnest worker
34	17	0	0	Serious but slow
35	20	2	2	Good steady worker
36	20	2	2	Very good
37	17	0	0	Fair—rather careless
38	17	2	3	Poor—very frivolous
39	18	0	7	Very poor (left school)
40	18	2	4	Good
41	18	3	0	Excellent
42	18	2	4	Uncertain—careless
43	16	2	2	Good
44	18	0	0	Very good

SECTION IV

Students by Number	Age	Years of Latin	Times Absent	Application
45	22	0	0	Earnest—has outside work
46	19	2	0	Earnest but weak
47	20	2	0	Very earnest but handicapped
48	18	0	2	Excellent
49	24	2	0	Fair
50	21	0	3	Good
51	20	1	0	Good
52	20	3	9	Good
53	18	0	3	Very good
54	18	2	4	Uncertain

SECTION V

Students by Number	Age	Years of Latin	Times Absent	Application
55	17	3	1	Excellent
56	18	1	4	Careless and uncertain
57	18	0	3	Very good (left school)
58	15	2	2	Bright but lacks industry
59	21	1	2	Superficial
60	18	0	8	Very poor (left school)
61	18	0	0	Tries—very timid
62	16	0	2	Frivolous
63	20	0	0	Fair
64	19	3	0	Serious
65	14	0	0	Good but lacks industry
66	19	2	6	Careless — lacks preparation
67	17	0	11	Very poor (left school)

From the above table it will be seen that the classes were not very different in size, the first having fifteen students; the second, thirteen; the third, sixteen; the fourth, ten (this fourth class was larger at the beginning, but several students dropped out); and the fifth, thirteen.

In age the students in all classes combined ranged from twelve to twenty-four years with an average of seventeen and one-half. To show how the different sections compared with regard to distribution of ages the following table is given:

TABLE II

DISTRIBUTION OF STUDENTS WITH REGARD TO AGE

Age	CASES IN EACH SECTION					
	I	II	III	IV	V	All
12	1	1	0	0	0	2
13	1	1	0	0	0	0
14	3	2	0	0	1	6
15	1	2	2	0	1	6
16	3	2	1	0	1	7
17	4	0	4	0	2	10
18	0	5	7	3	4	19
19	0	0	0	1	2	3
20	0	1	2	3	1	7
21	1	0	0	1	1	3
22	1	0	0	1	0	2
23	1	0	0	0	0	1
24	0	0	0	1	0	1
Average	16.7	16.3	17.5	20	17.7	17.5

Upon comparison of the different sections it is found that in each section except Section IV the majority of the students were between sixteen and eighteen years of age. Section II had a slightly lower average than any other of these sections, and Section V, a slightly higher. The students in Section IV were decidedly older than in the other classes, the average of the class being twenty, with no student under eighteen. If age is an important factor in learning a language, as is generally believed, it may be said that, as far as this one factor is concerned, the four sections first mentioned were upon an equal footing. From Section IV some difference might be expected.

Referring again to Table I the sections may next be compared with regard to the number of students in each who had studied another foreign language, Latin. Sections III, IV and V were about equal in this respect, about half of the students in each having had some work in that language, in most cases two years. In Section II, only five students had studied Latin, and in Section I, only three. It would appear, then, that Sections III, IV and V had a slight advantage over the other two sections in this respect. It will be seen, however, in a later table of results, that this advantage was not evident, at least in the majority of cases.

The absences as given in the table are for the first semester. As regards the number in the different sections, the differences do not seem great enough to be of significance except in the case of Section V. In this section the number of absences was decidedly greater than in any other section. The fact may be of significance and will be mentioned later.

The final comparison to be made in this connection is that concerned with what is called "Application" in the table. Under this heading have been given the estimates of Mr. White, Principal of the School, regarding the character of each student insofar as it might affect his school work. The statements were made the first week in May, that is, near the close of the school year. Mr. White was probably in a better position to make such statements than most principals are, since he has as one of his special duties the careful observation of all the students.

Comparing the sections it would seem that, on the whole, the attitude and character in Section I was most favorable, and that of Section V, least favorable. As these estimates, however, do not admit of quantitative measurements the reader is referred to the table.

It may be said, then, summarizing the comparisons just made, that, regarding the number of students in each section and their distribution as to age, the differences between the sections were not great enough to be of any significance except in the case of Section IV. From this section, because of its older class of students, some difference in quality of work might be expected. On the basis of knowledge of Latin, the students in Sections I and II might have been at a disadvantage.

As to absences Section V had the greatest number. Finally, as regards a favorable attitude toward work, Section I seems to have stood first and Section V last.

The teachers may be considered next. They will be designated by numbers, corresponding to those of the sections taught. Teachers I, II and IV were practice teachers, that is, they were teaching for the first time in preparation for their future work. Teachers III and V had taught German before, the former for only one semester and the latter for one year; Teacher III had also had some experience in grade teaching. As regards preparation for the work, the teachers were probably about equal. All had taken more than sufficient University work in German for a life certificate—that is, eighteen hours' work—and all but Teacher I had made that subject a major. In general, it may be said, upon the authority of the general supervisor of the school, that the differences between individual teachers were not great enough to be of much significance.

The same amount of time was given to the work in each section. The classes met three times a week, and each period was fifty-five minutes long. Counting out all vacations and holidays, there were ninety-nine periods in all. The time spent on different parts of the work is more directly concerned with the discussion of the methods used, which is the next topic to be considered.

Two methods were used, so that by comparison the advantages or disadvantages of either would be more evident. One was the method, already mentioned as being quite extensively used; a grammar method, it may be called, because, although it differs very much from the pure grammar method already described, it gives the emphasis to grammar study. The other method used may be called a reading method; although it also differs very much from the reading method described; it emphasizes reading. With both these methods there were the same underlying aims. The first aim was to attain the ability to read and understand with comparative ease simple idiomatic German; to understand it when it is spoken; and to speak it with good pronunciation and as much facility as possible after a year's study. The second aim was to secure a good foundation in German grammar. It will be noticed that these aims correspond closely with the problems raised at the close of the discussion of methods, which may be repeated: How learn grammar in the first year and not give this study undue emphasis? How acquire an easy reading knowledge and yet not be superficial? How attain some ability in the use of the spoken language and yet not make this the chief aim? How, finally, adapt the work to the interests of high school students? According to the degree in which these aims were realized, and according to the success with which these problems were solved, the methods must be judged. The two methods may now be described more fully.

THE GRAMMAR METHOD

According to the first of the methods to be described, the Grammar method, it was planned to begin the study of the language with a study of its grammar. It was further planned to complete this study, at least as far as its essentials are concerned, in as short a time as possible considering the method used, and then to devote the remainder of the time to reading. Conversation to a limited extent, was to be carried on in both grammar study and reading.

Following this plan, then, the work began with the study of Spanhoofd's Grammar, **Lehrbuch der deutschen Sprache.** In contrast to the study by the pure grammar method, and following the plan of the text used, an attempt was made to make the study as inductive and concrete as possible, considering the very limited vocabulary of the students. The book commenced with a very simple and easy vocabulary, most of the words in the beginning lessons being very much like their English equivalents: for example, the first sentence, "Der Sommer ist warm". Each lesson consists of several parts:

(1) A development section which is preparatory to the grammar concerned in the lesson.
(2) A reading section, the material of which is small in amount, being as the author says, of "minor importance" at this stage of the work.
(3) A grammar section, which, according to the author, is the "foundation" of the lesson.
(4) A vocabulary including the new words used.
(5) A section devoted to exercises based upon the grammar concerned in the lesson. These exercises consist of conjugations, declensions and the like, and translations of German into English and English into German.

Although the plan of the book was closely followed, the teachers did not confine themselves entirely to it. For instance, especially after the first few weeks, they did not find it necessary to read over all the material in every development section, but often devised ways of their own to develop the same facts. Then as to the exercises, not all the English into German was translated; for the first two months this work was omitted entirely, then the class went back and devoted several weeks to it. In this way an effort was made to limit the use of the English as much as possible. The topics were taken up in the order in which they occur in Spanhoofd—an order not unusual in grammar. The lessons as divided in the text could not all be taken as lesson units; in many cases they were too long and had to be subdivided into two or three lesson units. Of the thirty-five lessons as divided in the text, thirty-three were covered in eighty-five periods, (fifty-five minutes each). The class began to read the fifteenth of May, having fourteen periods until May twenty-seventh (the close) to devote to this work. Thus about five-sixths of the time had been given to the study of grammar, and the remaining time to reading.

THE READING METHOD

The other method used, the Reading method, as it may be called, is almost directly opposed to the Grammar method just described. According to this second method the study of the language began at once with the reading of easy German stories, and ended with a brief systematic study of grammar. The discussion of the work as conducted falls into several parts, corresponding to the different periods into which it was divided.

The first period of the work, occupying almost three months of time, was governed by the following principal aims:

(1) To acquire a good pronunciation.
(2) To learn a relatively large German vocabulary.
(3) To develop, as much as possible in so short a time, a feeling for the German language, its form and use.

To accomplish these aims the work was conducted as follows: Simple easy German stories were read aloud, careful attention being given to pronunciation and expression. This reading was done, a sentence or two at a time, at first by the teacher and then by the students. For several periods at the beginning of the work every part of the new lesson was read first in class; and the home work of the students consisted in going over the same work trying to better their first attempts made in class. The meaning of each new word, when not evident from the context, was told in this class study, and the students were expected to remember it next day. Whenever possible, the new word was explained by a synonym already familiar to the students. The text first used, Foster's **Geschichten und Märchen,** was not provided with a vocabulary or with notes —it was selected partly because of this fact—so the students had to depend largely upon memory. Direct translations were not often called for, being required only when there was doubt as to the meaning. Instead of direct translations, questions were asked which would show whether the reader understood what he was reading. This was judged also by the expression with which it was read. The students knew, however, that at any time translations might be called for and they were usually ready to give them. To give practice in understanding the spoken language, stories were often read, in German, to the class, and either the meanings of different passages called for at intervals or the content of the whole at the end. This last was given in English, necessarily. At other times students were asked to tell in German short stories or parts of stories which had been read in class. To do this, of course, special preparation on their part had to be made. Grammar in this first period was entirely incidental. It was introduced only when necessary or particularly helpful in understanding what was read, or in response to questions of students. Any grammatical fact which was thus introduced, however, was kept in mind and used from day to day. It was hoped and expected that even with this incidental attention, a good many things concerning grammar would be learned and in a concrete way. Toward the close of this period a kind of oral test, not recognized as such by the students, was given to find out just what results along this line had been attained. The results of this test decided, in part, the plans for the next period.

In the second period of the work, beginning the first week in January—that is, in the fourth month of the school year—although the aims of the preceding period were still the leading ones, some more definite attention was given to grammar. What had been incidentally learned thus far was gotten into an orderly system, and the study of new grammatical facts became more systematic. It was planned to emphasize some one grammatical fact in each lesson. Numerous examples were found in the reading material each day to illustrate the fact selected, and further examples were found by the students as a part of their outside work. Note books were kept in which all work relating to this grammar study was recorded. For instance, when word-order received special attention, different illustrations were found in the reading lesson for that day, and from these examples as well as from what had been absorbed—one might say—from the continual use of the German sentences, rules were formulated by the students. Examples either from reading, or in original sentences were then written in the grammar note books. These books were called for at any time when it was thought desirable. Thus, although the main attention was still given to reading, some study of grammar in a very concrete way was accomplished.

In the third period, which began the second week in April and included six weeks of time, a very systematic study of grammar was taken up. Reading was laid aside and for the first time a text in grammar was used—the same one used in the grammar sections. The method used differed necessarily from that used in these sections. Of the five divisions in each lesson as divided by Spanhoofd, only the grammar division was used. The brief preparatory work, corresponding to the development section in the text, was original with each teacher. The vocabulary used was that acquired by the students throughout the year. The exercises used to apply the grammatical facts of each lesson, were also taken from reading material already familiar to the students. The lessons were not taken up in the order of the text, but were selected in accordance with the topics studied. These topics were taken up in somewhat the following order: nouns and adjectives; pronouns; prepositions; conjunctions and adverbs; and verbs, including participles, modals, active and passive voice, and subjunctive mood. This does not mean that the lessons were disconnected, one dealing with nouns alone, another with prepositions alone, and so on; it denotes rather the emphasis given at different times. It may seem odd, for instance, to see nouns and verbs so separated. In reality they were not, for the students had a comparatively large vocabularly to draw from, and could use different verb forms in connection with nouns. Moreover, in most cases the sentence was the unit and not single words. Thus, although word-order does not have a definite place in the order above, it was considered in practically every lesson. On the whole, eighteen lesson periods were given to this work, leaving four more until the close of the year to devote to reading. Thus, in the study of the language according to this method, only one-fifth of the time had been given to work in which the study of grammar was the leading aim.

TEXT-BOOKS USED

The text-books used in the Grammar sections were:
- I. Spanhoofd—Lehrbuch der deutschen Sprache
- II. Guerber—Märchen und Erzählungen I (81 pages)

Those used in the Reading sections were:
- I. Foster—Geschichten und Märchen" (102 pages)
- II. Guerber—Märchen und Erzählungen I (92 pages)
- III. Allen—Herein (36 pages)
- IV. Spanhoofd—Lehrbuch der deutschen Sprache

III.—TESTS

The methods were judged, as planned, according to the comparative success with which the aims of the year's work were realized and the problems, as stated in connection with these aims, were solved. Concerning the second aim,—that relating to grammar—specific tests could be given which, as far as custom is concerned, might be considered conclusive. As regards the other aim—that relating to reading—it was not so easy to give such tests. Careful observation from day to day seemed the best way to decide as to the comparative ability of the different classes in this respect. However, one further test was given in connection with this aim, a discussion of which will be given later. The test given in grammar will now be considered.

GRAMMAR TEST

The same grammar test was given to all classes, both grammar and reading sections, at the same time. The students had not prepared for it in any way. Formal tests are not a usual thing in the University High School, and the students had not been told that this particular one was to be given. Thus no special preparation was possible. The test was given the first week in April. It will be remembered that it was just at this time that the different sections were about to change their plans of work; to shift the emphasis given thus far. The reading sections were to lay aside reading and take up a text book in grammar for the first time for systematic study, and the grammar sections were to lay aside the study of grammar and begin reading. The test was given at this time simply to get some definite data concerning the comparative ability of the two divisions in grammar—of the one which had made the study of grammar, so far, incidental, and the other which had emphasized the study of grammar.

The questions called for the use of a vocabulary which should be familiar to any class at this period of work, but which was not taken expressly from any material used in any class. They called for declensions of nouns with adjectives, using both definite and indefinite articles; for principal parts and conjugations of verbs, both strong and weak; for comparisons of adjectives; for a translation of a German selection, taken from a book unfamiliar to any class (**Collar's Eysenbach,** "German Lessons," page 167); and finally, for a translation of English sentences into German. This last question called for a knowledge of word-order—normal, inverted, and transposed; of personal and relative pronouns; of adjectives used with nouns and as predicated adjectives; and of cases governed by different prepositions. The questions are given below:

I. Decline in both numbers:
  1. The old woman, the little child, the dear brother.
  2. An old woman, a little girl, a good brother.

II.
  1. Conjugate in Present Indicative (active):
     sein, sagen, sehen.
  2. Give Principal Parts (with auxiliary) of:
     sein, sagen, rufen, kommen.

III. Compare:
  jung, alt, grosz, neu.

IV. Translate:
  Ein Hund und ein Hahn schlossen Freundschaft und wanderten zusammen in die Fremde. Eines Abends konnten sie kein Haus erreichen und muszten in Walde übernachten. Der Hund sah endlich eine hohle Eiche worin für ihn eine vortreffliche Schlafkammer war. "Hier wollen

wir bleiben" sagte er zu seinem Freunde. "Ich bin es zufrieden," sagte der Hahn, "aber ich schlafe gern in der Höhe." Damit flog er auf einen Ast, und bald schlief er ein.

V. Express in German:
1. Today Karl went into the woods.
2. He took his brother with him.
3. His brother's name is Wilhelm.
4. Wilhelm, who is a little boy, soon became tired.
5. They saw many beautiful flowers in the woods.

The translations of English into German had never been asked before of students in the reading sections; in the grammar sections such exercises had been given in connection with the first half of Spanhoofd's grammar. The results of the test may now be considered.

In order to make a better comparison possible the grade each student made in the test is given in connection with the grades he received in all subjects (including German) studied the first semester. In the table giving these, the students will again be designated by numbers, corresponding to those in Table I.

TABLE III

GRADES OF STUDENTS IN VARIOUS SUBJECTS

SECTION I (Grammar)

Student	English	History	Mathematics	Sciences	Manual Training	Latin	German	Test in German Grammar
1	S	S-	S-S				S	75
2	S	E	S			E	S	96
3	M	M	M				M	76
4	M		S		M		S	49
5	S	M			M		I	60
6		E					E	68
7	M	I	M				M	19
8	S	S	S				S	74
9	S	S	S				M	60
10	M	S	M				M	60
11	I	S	M				I	left school
12	E	E	S				E	83
13	S	M	S				M	42
14	E	S	S				M	68
15	S	S	M				S	44

SECTION II (Reading)

Student	English	History	Mathematics	Sciences	Manual Training	Latin	German	Test in German Grammar
16	M	M	M				I	59
17		I	F		M-M		M	57
18	M	M	M				M	65
19	I	I	M					Absent
20	E	M	M		S		M	Absent
21	M	S		M			M	71
22	I	M			M		M	56
23	E	M	S				S	78
24	S	M	M				E	96
25	M	M	S				M	70
26	I	M-I	M				M	46
27	E	I			S		M	50
28	M	M	M-S				S	51

SECTION III (Reading)

Student	English	History	Mathematics	Sciences	Manual Training	Latin	German	Test in German Grammar
29	In school only part of first semester							70
30	I	M	F				M	44
31	I		S			I	M	62
32	F	I					M	55
33		I	M	I			S	65
34	I	M	M				M	66
35	M	M		M			M	65
36	M		S	E	E		M	68
37	F	F	M				M	77
38	S	M		M			I	Absent
39	M	F			I		I	left school
40	I	M	M				M	77
41	S		M				E	96
42	M	I			I		M	64
43	M	I	M				M	75
44	I	M	M				S	Absent
SECTION IV (Grammar)								
45	I			M			M	63
46	F	F	M				M	43
47	M		F				F	58
48	M	M	E		M		S	80
49	M	M	M	M			M	75
50	M	S	S				M	82
51	I	M	S				M	61
52	M	I		M			M	58
53	S	S	S				M	65
54	I	F	M				M	24

SECTION V (Reading)

Student	English	History	Mathematics	Sciences	Manual Training	Latin	German	Test in German Grammar
55	M	M		M			S	67
56	I	F					M	25
57	M			M			S	left school
58	M	S	I			S	S	76
59	M			M-F			S	50
60	M	M	F				M	left school
61	I			M-I			M	Absent
62	M	M			S		M	52
63	M	M		E	M		M	56
64	S		S	E		M	S	46
65	M	S	I				S	80
66	I	I					I-(F)	43
67	M	M	M				F	left school

The grades denoted by letters were given more or less in accordance with the system used in the University. **M** means average, or medium; **S** means a grade above medium; **E** means excellent; **I** means inferior; and **F** means failure.

It is supposed that about one-half the students in a class would receive a grade of **M**, one-fourth **S** and **E**, and one-fourth **I** and **F**. Only very excellent students are supposed to be given **E**, and those who fail, **F**. However, it is not required that every class be graded in this way. For instance a class may be composed of only average students, in comparison with what the standard should be, and may be graded so. Probably this explanation is sufficient for these grades.

As for the grades made in the test it was thought best to use a numerical system. The following plan was adopted in order to make the grading of each student as accurate as possible. All the first-year German teachers decided just what percentage would be allowed for each question. Then the examination papers were divided into groups, which were corrected in turn by each teacher. The grades as recorded by each were then compared. The differences in grades given were very slight. In cases of difference the average grade was taken. The grades in general are not high. It must be remembered, however, that the test was a complete surprise to both teachers and students, the more so since such tests are very unusual in the school. Moreover, the grading was probably much more severe than is usual with most teachers. Had it not been for these facts the grades might have been considerably higher.

A comparison of the different sections is rather difficult to make from the table just given, because of its length. To make the comparison easier the following table is given. It will show the distribution of grades in each section—that is, of grades made the first semester—and the average grade of each section as made in the test. Thus it is a summary of the preceding table.

TABLE IV

DISTRIBUTION OF GRADES MADE DURING FIRST SEMESTER IN VARIOUS SUBJECTS

Number in each Section						Percentage in each Section			Av. Test Grade in German Grammar
*Section	E	S	M	I	F	E & S	M	I & F	%
(G) I	8	28	20	4	0	60	33 1/3	6 2/3	62
(R) II	4	9	34	8	1	23 3/14	60 10/14	16 1/14	64
(R) III	3	6	30	15	5	15 15/59	50 50/59	33 53/59	68
(G) IV	1	7	23	4	5	20	57 1/2	22 1/2	61
(R) V	2	12	26	9	4	26 22/53	49 3/53	24 28/53	55

In the above table it is seen that, as regards general scholarship, denoted by semester grades, the sections stand in the following order: Section I decidedly first; Section II, second; Section V, third; Section IV, fourth; and Section III, decidedly lowest. As regards the average grades made in the grammar test, however, the sections stand thus: Section III, highest; Section II, second; Section I, third; Section IV, fourth; and Section V, last.

An explanation should be made concerning the last section, Section V. Besides the fact mentioned above that in this section there were more absences than in any other, there is another reason which partly accounts for the section's low standing in grammar. The

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*(G) indicates Grammar Section; (R), Reading Section.

teacher who taught this class the first semester, although very capable, did not conduct the work quite in accordance with the plan for the reading sections. Each day's lesson was not planned as carefully as it was in the other two reading sections. The class read more German during this semester than any other class and read well, but the grammar work was somewhat superficial. Little record was kept, mental or otherwise, of grammatical facts considered incidentally in class, and as a consequence the work from day to day was not connected.

However, even though this section with its low grade is included with the two other reading sections (II and III) and the average grade taken of all the students in these sections, the result is favorable when compared with the average grade of those in the grammar sections. The average of the former group is 63% and of the latter 62%. This difference of one per cent is, of course, not striking. When we consider, however, that Section III, a reading section, ranks six per cent higher than one grammar section (I), and seven per cent higher than the other grammar section (IV); when we remember that this reading section stood far below both the grammar sections in general scholarship (See Table IV), the differences are significant. The same thing is true when the other reading section (II) is compared with either grammar section.

From this particular test, then, it may be concluded that the reading sections, though they had not up to that time emphasized the study of grammar, ranked considerably higher in their knowledge of grammar than the grammar sections, which had emphasized grammar study thus far. Their comparative ability in reading will be considered in the next section.

READING TEST

A test in reading was given to all classes in first-year German on May twentieth. It is very probable that in this test, as in the former, the grammar sections had a slight advantage. They had been reading aloud connected stories in German during every class period for a month and a half, while the reading sections had been giving the same amount of time to the study of grammar and had not, during this time, done any connected reading. It was necessary, however, to give the test at this time, if it were to be given at all, because of the short time until the close of school, May twenty-seventh.

This test was also a complete surprise to both teachers and students. The five sections were divided into three groups, which were judged in turn. Stories were selected with which the students had been familiar but which they had not read recently. There was one exception to this,—Section I read the story which had been their preceding lesson. The reading of each individual student was graded on the basis of pronunciation and expression. Professor Almstedt, Professor of German in the University of Missouri, was the judge, and the results, as given later, are based entirely upon the report which he gave. This much should be said: Professor Almstedt emphasizes pronunciation in reading and it is therefore probable that a student who received from him an average grade in pronunciation would, according to the usual standard in high schools, rank as a very good student in this respect. It should also be said that Professor Almstedt did not know to which Section individual students belonged.

The results of the test are given in the table below according to individual students in each section. The grades given should not be confused with the system used in the University, and, with some modifications, in the High School, as has been explained. Letters were used simply as a matter of convenience; numbers or words might have been used instead. **M** indicates a medium grade, **S** superior, and **S** — or **M** + or **M** —, between. **I** indicates a grade below average, and **I** + or **M** —, grades between. Grades such as **M** —/**I**+ indicate doubt on the part of the judge; they are on the border-line, one might say, between **M** and **I.** **F** indicates failure.

TABLE V

INDIVIDUAL GRADES MADE IN READING TEST

Section I	Section II	Section III	Section IV	Section V
*1. M	16. M—	29. M—	45. M—	55. M—
2. S	17. M—/I	30. I	46. M—	56. I
3. M—/I	18. M—	31. M	47. M—	57. Absent
4. M—	19. Absent	32. M	48. M	58. M+
5. I	20. Absent	33. S—	49. M—/I	59. M
6. M—	21. S—	34. M—/I+	50. M	60. Absent
7. F	22. I	35. I—	51. M+	61. M—
8. M+	23. M	36. I	52. M—/I	62. Absent
9. I	24. S+	37. Absent	53. M—/I	63. F
10. I+	25. M—	38. Absent	54. M—	64. M—/I+
11. Absent	26. I	39. Absent		65. M+
12. M—	27. M—/I	40. M—		66. I—
13. M—/I+	28. M+	41. M		67 Absent
14. M—		42. M+		
15. M		43. M—/I+		
		44. S		

Only a few comments on individual students seem necessary. Student Number 2, the only **S** student in both grammar sections, had these advantages over the other students in these sections; first, he is of German parentage; though he did not speak the language to any extent when he began the year's work, yet he had often heard it spoken in his home; and second, he had been in a reading section for the first three months of the year, during which time the class read the first book—one hundred and two pages. Student Number 24 in Section II, who received a grade of S+, is also of German parentage, and thus probably had an advantage over her classmates. Besides these two students there were several others whose names, at least, were German. Since, however, they seemed to possess no advantages over the rest of the students further comment is unnecessary. The following table will show the distribution of the grades just given according to sections.

*Numbers designate students as in preceding tables.

TABLE VI

GRADES RECEIVED IN READING TEST

	Number of Students in Each Section											
Sections	S+	S	S—	M+	M	M—	M—/I+	M—/I	I+	I	I—	F
*(R) III		1	1	1	3	2	2			2	1	
(R) II	1		1	1	1	3		2		2		
(R) V				2	1	2	1			1	1	1
(G) IV				1	3	4		2				
(G) I		1		1	2	4	1	1	1	2		1

Comparisons from the above table are not easy to make: the pluses and minuses and the doubtful cases are a little confusing. For purposes of comparison different groupings might be made. For instance a grouping might be made with all the M's, above and below, in one division, the S's in another, the I's in another, and the F's in another. Were it not for the doubtful cases this might be the best arrangement. As the records stand, however, the best and simplest grouping is probably the one given below.

TABLE VII

GRADES ARRANGED IN GROUPS

	Upper Group		Median Group		Lower Group		Total Number of Students
Grades included	S+, S, S—, M+		M		M—, I+, I, I—, F		
Number and percentage of students in combined sections:	No.	% of Total	No.	% of Total	No.	% of Total	
*(R) III	3	23 1/13	3	23 1/13	7	53 11/13	13
(R) II	3	27 3/11	1	9 1/11	7	63 7/11	11
(R) V	2	22 2/9	1	11 1/9	6	66 2/3	9
(G) IV	1	10	3	30	6	60	10
(G) I	2	10 4/14	2	14 4/14	10	71 6/14	14
Reading III, II, V	8	24 8/33	5	15 5/33	20	60 20/33	35
Grammar	3	12 1/2	5	20 5/6	16	66 2/3	24

*(R) indicates Reading Section, and (G), Grammar Section.

Thus the grades are divided into three groups, **M** naturally being the medium group, all above that grade, the upper group, and all below it, the lower. An ideal plan, if possible, would be to divide the students, for purposes of comparison, into two groups only, those above and those below the midline of average ability. Although it was not possible to do this with the grades used, the plan adopted approaches it closely, since the "M" grades form a comparatively small median group of division. The number of students in each group are given, first according to individual classes, or sections, and then in the reading sections combined, and in the grammar sections combined. A comparison of the individual sections shows that they stand in this order: 1. Section III, 2. Section II, 3. Section V. (These are the three Reading sections.) 4. Section IV, and 5. Section I. It may be noticed that Sections III, II and IV stand in the same order as in the grammar test, but that Sections I and V have just changed places—Section I from third place in grammar test to fifth place in reading test. For the present purpose, however, a comparison of the individual sections is not so important as that of the combined sections, the reading sections III, II and V being one combination, and the grammar sections I and IV, the other.

The groups which are of concern in a comparison of these combined sections are, of course, the upper and the lower. The median group simply shows the number of students in the two combinations who are, supposedly, on a par; thus the 20 5/6% of the grammar section students and the 15 5/33% of the reading section students who are on a par may be excluded from the comparison. Considering, then, both the upper and the lower groups it is seen that the combined reading sections are decidedly superior. The percentage of their students in the upper group is 24 8/33, while that of the grammar sections is only 12 1/3; this means that there are practically two students of the former to one of the latter in this group. Moreover, the percentage of students from the reading sections in the lower group is 60 20/33, while that from the grammar sections is 66 2/3—a difference of a little more than six per cent in favor of the former.

It is evident, then, that the reading sections, both singly and combined, are decidedly in advance of the grammar sections. If the test had been given a few days later, after the reading sections had had one or two periods of time for oral reading of connected material after their month and a half of grammar study, the differences might, and probably would, have been still greater. As it is, when we compare the sections as they rank in this test with their rank in general scholarship, the difference is striking.

CONCLUSION

The two methods have been compared as to the results obtained by each in the study of grammar and in reading. It has been seen that the reading sections which gave the study of grammar much less emphasis than the grammar sections—and probably much less emphasis than is usually given this study in the first year's work—stood better in a grammar test given before they had even begun on the final period of their work, the period devoted to grammar study. It has also been seen that these same sections stood decidedly better than the grammar sections in a reading test given toward the close of the year, after the grammar sections had spent a month and a half in reading. Moreover, the amount of reading material covered by the grammar sections was very much more than that covered by the grammar sections. The former read two books and part of a third (two hundred and thirty pages in all) and the latter one quite one book (eighty-one pages). This does not, of course, include the grammar text.

Earlier in this paper it was said that the methods were to be judged according to the comparative success with which the aims were realized and the problems connected with these aims were solved. It may be concluded, then, that, as far as the aims regarding grammar, pronunciation and reading are concerned, the reading method, as used, has proved decidedly the better. Moreover, from what has been said it is evident that the reading method has been more successful in solving at least two of the problems raised: How learn grammar and yet not give this study undue emphasis? How acquire an easy reading knowledge and yet not be superficial? The aim concerned with speaking the language, and the problem connected with the interests of the high school students, yet remain to be discussed.

No specific test was given concerning the ability of the students in speaking German; this could best be judged by observation from day to day. Judging from this, then, it may be said unhesitatingly that in this respect the reading sections also ranked first. It would be quite natural that they should, considering that for almost seven months they read German stories constantly, very often answered questions upon this reading in German, and often told either whole stories or parts of them in German. Their ability to understand the language when spoken or read aloud to them was decidedly better than in the grammar sections. At different times this experiment was tried: Easy German stories were read aloud to the different classes and the students were asked to tell the content in English. In every case the reading-sections were better able to do this. This judgment is based upon observations made by the writer.

We come, finally, to the problem of interest. Here, also, it may be said quite unhesitatingly, that the reading method seemed better adapted to the interests of the students than did the grammar method. This statement is based, not only upon careful observation of all classes, but upon the opinion expressed by the different supervisors and teachers and, more especially, by earnest students. During the first semester of the work the difference in interest between the two sections—that is, between reading and grammar sections—was very evident to those who went from one class into another for the purpose of observation. The reading sections were doing work of a more concrete character and it was natural that their interest should be greater. Moreover, it was natural that the reading sections shrould be more interested in the systematic study of grammar taken up after they had acquired a large German vocabulary and after they had learned, incidentally, many things concerning the formal side of the language, than were the grammar sections at the beginning of the year, when the language was new to them.

It may be concluded then, from the study and comparison of these two methods, that the reading method, in that it has more nearly realized the aims of the first year's work in German and more successfully solved the problems connected with this work, is the better adapted for high school use.

BIBLIOGRAPHY

Aldrich, L. D.: The Function of Grammar in the Teaching of Modern Languages. N. E. A. (1904) 525-28.

Angus, Frances A. (University High School, University of Chicago); The Teaching of French in the University High School. School Review 16: 125-33 (1908).

Bagster-Collins: The Teaching of German in Secondary Schools—(1904).

Bahlsen-Leopold: New Methods of Teaching Modern Languages. (Translated by Marshall B. Evans). Extract in Teachers' College Record 4: 161-251. (May, 1903).

Jespersen, Otto: How to Teach a Foreign Language. Translated from Danish original by Sophia Bertelsen (1904).

Report of the Committee of Twelve of the Modern Language Association of America, 1898.

Smith, G. A.: The Aim of Modern Language Study in our Secondary Schools—N. E. A. (1904) 522-24.

Spanhoofd: Aim and Character of the Work of First Year German. Education 24: 258-95 (1904).

Sachs, Julius: Modern Languages in Secondary Schools. Educational Review 29: 163-80 (1905).

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A.

EDUCATION SERIES
Volume 2 Number 1

CIRCULAR OF INFORMATION
TO
ACCREDITED SCHOOLS

ISSUED BY THE COMMITTEE ON ACCREDITED SCHOOLS

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UNIVERSITY OF

SIXTH EDITION, REVISED

UNIVERSITY OF MISSOURI
COLUMBIA, MISSOURI
October, 1913

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INTRODUCTORY

Organization is the order of the day. In education, as in manufacturing and commerce, it is indispensable to the greatest efficiency. To prevent wasted energy and discouragements which turn many young people from the pathway of their highest development, demands a closer co-operation of the educational forces of the State. This truth is now generally recognized; and, as a result, the efficiency of education in Missouri has been rapidly increasing. County supervision and articulation of elementary and high schools are phases of a general movement which includes also the affiliation of high schools and University, so that there may be a pathway direct from the primary school of any community to the highest educational opportunities offered by the State. For the same reason that high schools must take the initiative in solving the problem of articulating elementary and secondary schools, the University must take the initiative in solving the problem of affiliating high schools and University. Accordingly, in view of a growing demand for organization, the University presents a plan, modified by several years of careful direct study of the school situation, whereby graduates of secondary schools may be admitted to the University without entrance examinations.

This plan necessarily includes a definition of conditions for accrediting. In determining these conditions, it has been the policy of the University to consider in the broadest sense the welfare of high schools. Due recognition has been made of the facts that most graduates of secondary schools do not attend institutions of higher learning, that local conditions vary, and that many schools meet with most discouraging difficulties. It is desirable that high schools have the greatest possible freedom consistent with the purpose of affiliation, and it is the intention of the University to co-operate with them rather than arbitrarily to impose conditions upon them. Accordingly, criticisms of the plan here offered are invited. The administration of this plan requires the examination of each school by an educational expert, whose advice may be taken advantage of by local authorities who wish to improve their schools. This method of affiliation has been justified by the rapid development of many Missouri schools under its influence. As mutual understanding, confidence and co-operation more widely increase, even greater progress is promised for the future.

This circular is prepared for the information of superintendents, principals, teachers and members of school boards who wish to co-operate with the University in this movement. It contains a statement of conditions for the accrediting of secondary schools, outlines of approved subjects and suggestions for the equipment of laboratories and libraries.

Although there is a distinction between conditions for the accrediting of schools and conditions for admission to the University, some brief information with regard to the latter may appropriately be given in this introductory statement. (a) Graduates of an Accredited School who bring proper credentials of the fact that they have completed the subjects required for entrance to the college which they desire to enter, will be admitted to the University without examination. For these requirements see table in annual catalogue. The student graduating with the highest honors from any Accredited School will be awarded a Curator's scholarship, entitling him to be admitted free of library, hospital and incidental fees for the first year. (b) The diploma will not be accepted as a credential. The student must present the proper form of certificate signed by the principal or superintendent of the Accredited School. Blank certificates will be furnished by the Dean of the University Faculty upon application. The University recommends that Accredited Schools do not issue such certificates to any students except those that have graduated. A certificate of graduation will not be accepted for full value in lieu of entrance examinations, unless the high school course of the pupil has been four years in length and all of the work has been done in the regular sessions of the school. This certificate should be filled out and sent to the Dean of the University Faculty, as soon as possible after the student's graduation. It is desirable that the certificate be sent in advance in order that possible errors may be detected and the student notified accordingly.

Copies of this circular may be secured through the office of the Secretary of the Committee on Accredited Schools, University of Missouri, Columbia, Missouri.

CONDITIONS FOR THE ACCREDITING OF SECONDARY SCHOOLS

A school desiring to be placed on the accredited list of the University should present, as early in the school year as possible, an application to be accredited, blank forms of which will be furnished, upon request, by the Secretary of the Committee on Accredited Schools. After the application has been received, the school will be placed on the visiting list and in due time will be inspected by the High School Visitor. No school will be accredited until the report of the Visitor has been passed upon by the University Committee on Accredited Schools.

In order to be fully accredited by the University, a school must meet the following *minimum* requirements:

1. The course of study must be four years long; and the school term, nine months.

2. There must be at least three teachers in the school, one of whom may be superintendent, but the other two must give their entire time to high school work.

No teacher should have daily more than the equivalent of six single periods of teaching as hereinafter defined, (a less number would be preferable), and, where any teacher has more than this number, the presumption is against the efficiency of the work.

It is strongly recommended that in the selection of teachers, graduates of universities and colleges of recognized standing, or teachers who have had equivalent training, be preferred. With the large increase in teachers having college training, and with the excellent opportunities now offered by the summer schools, the University cannot afford to accredit any school, seeking affiliation, that shows an indifference to the grade of scholarship of the teachers employed.

3. There must be at least one laboratory of science, sufficiently large and well equipped to permit easily of individual work on the part of the pupils.

4. There must be good equipment for the teaching of History and English. This means that the school must have an adequate reference library and a sufficient supply of historical maps.

5. Not less than fifteen units as hereinafter defined must be required for graduation.

Normally no pupil should be permitted to carry more than four subjects at any one time.

6. The school must give satisfactory instruction in subjects as specified below.

By a "unit" is meant a year's work in a subject, with five periods a week. Three periods a week for two years will be accepted as the equivalent of a unit. By a "period" is meant not less than forty minutes of time devoted to actual teaching or eighty minutes devoted to laboratory work.

In the case of the sciences and of Household Arts and Agriculture, at least two of the five periods must consist of eighty minutes each devoted to laboratory work. In the case of Drawing, Manual Training and Bookkeeping, each of the five periods must consist of eighty minutes. In the case of Music, forty minutes counts as a half period, so that five forty-minute periods a week for two years is the equivalent of a unit.

The specifications with regard to subjects in which instruction must be given are as follows:

English .... 3 units.

Mathematics .... 2 units.

History .... 2 units.

Foreign Language .... 2 units.

These two units must be in *one* foreign language, which may be Latin, Greek, French, German or Spanish.

Science .... 2 units.

The two units in science may be in General Biology, Zoology, Botany, Physiology, (provided that the Physiology is preceded by a year's study of Biology), Chemistry, Physics or Physical Geography; or one unit may be in any one of these sciences and the other in either Agriculture or Household Arts.

Elective Subjects .... 4 units.

These four units, which are to be given in addition to the ones specified above, must be selected from the subjects named in the following list, in which the maximum and minimum number of units accepted in each are indicated:

Subjects	Maximum	Minimum
English	4	3
Algebra (elementary)	1½	1
Plane Geometry	1	1
Solid Geometry	½	½
Trigonometry	½	½
‡Arithmetic (advanced)	½	½
‡Algebra (advanced)	½	½
History	4	2

(Continued on page 9)

‡The courses in advanced Arithmetic and advanced Algebra are not approved, if they are not preceded by those in elementary Algebra and Plane Geometry.

Subjects (Continued)	Maximum	Minimum
American Government (Civil Government)	½	½
Latin	4	2
Greek	3	2
German	3	2
French	3	2
Spanish	3	2
Physics	2	1
Chemistry	2	1
General Biology	1	1
Botany	2	1
Zoology	2	1
†Physiology	1	1
Physical Geography	1	1
Agriculture	1	1
Music	1	1
Drawing	2	1
Manual Training	2	1
Household Arts (Domestic Science and Art)	2	1
Economics	½	½
Commercial Geography	½	½
Bookkeeping	1	½
Teacher-Training Courses	2	½

†In cases where the study of Physiology has been preceded by a year's study of Biology.

7. When instruction in subjects named in the above table is given in excess of the minimum requirement, it must, in every case, be efficient.

Secondary schools which maintain a four years' course of study, but do not fulfill all the requirements for a fully accredited school, may be *partially accredited.*

The University reserves the right to cease to accredit, at any time, a school that employs inefficient teachers or that otherwise fails to maintain the required standard.

I

OUTLINE OF APPROVED SUBJECTS

ENGLISH

FOUR UNITS MAY BE OFFERED

Literature. It is recommended that one-half of the time allotted to English be given to the study of literature, by which is meant not the study of a manual on the history of literature, but literature itself in the selected works of representative authors. Masterpieces as a whole, suited to the attainments of the class, should be read in class and carefully examined, while other works may be assigned as collateral readings, of which reports, written or oral, should be required. In the fourth or last year, in connection with a wider range of reading in literature, a brief history of the literature may conveniently be used.

English Grammar. Everywhere pupils enter the high school with an inadequate knowledge of English grammar. The systematic study of grammar, therefore, as the foundation of higher scholarship in English, should be pursued in the high school. An accurate knowledge of grammar and of grammatical analysis is often indispensable to the right interpretation of literature and to confident correctness in composition. Without strict grammatical training the pupil finds himself at a disadvantage in trying to grasp the meaning of an involved sentence as well as in the attempt to express without ambiguity his own thoughts.

The method of teaching grammar should almost invariably be inductive. By making use of the pupil's own words and sentences, his reading, and his composition, one can easily establish the simpler definitions, rules, and principles of grammar. As each point is made, it will be well to refer to a text-book by way of confirmation of what has been found. Following upon this, drill exercises, drawn from the text-book, could be used to advantage. The study of grammar should never become merely formal. All definitions, classifications, and rules should be seen to grow out of, and ever refer back to, words and sentences. The object of the work is not that one may be able to define the parts of speech and state rules, but that he may understand the logic of the sentence. All parsing and analysis should be made a study in relations among words and sentences. Diagrams are of little real aid, and are likely to create a wrong impression of the purpose of the work. No pupil should be graduated who cannot analyze correctly a normal English sentence of moderate complexity.

Composition and Rhetoric. Training in the use of the language should be a part of the work in English throughout the course. The English, spoken and written, of the pupils should be watched and corrected not only in their English classes, indeed, but in all their written work. The principles governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered. In the English classes, it is advised that set exercises be required every week for the first two years, and, in the third and fourth years, in addition to these exercises, a carefully prepared paper at least once a month; that a due proportion of the class time be devoted to the discussion of these exercises and to explanation of the simpler rules of good writing; and that the exercises be then re-written with correction of errors. The pupil's work in literature, his other studies, and his daily experiences will furnish abundant topics for these exercises. It is most earnestly urged upon teachers that a certain standard of skill in writing be established for each year, and that no pupil be advanced to a higher class in English until he has reached that standard in his written work.

List of Readings in Literature. The list of readings in literature recommended by the National Conference on Uniform Entrance Requirements in English at its last meetings (February 22, 23—May 30, 1912) for the years 1915-1919, and approved by the University, is as follows:

A. Reading. The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except as otherwise provided under Group I.

Group I. Classics in Translation. The *Old Testament,* comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the *Odyssey,* with the omission, if desired, of Books, I, II, III, IV, V, XV, XVI, XVII; the *Iliad,* with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid.* The *Odyssey, Iliad,* and *Aeneid* should be read in English translations of recognized literary excellence.

For any selection from this group a selection from any other group may be substituted.

Group II. Shakespeare. *Midsummer-Night's Dream, Merchant of Venice, As You Like It, Twelfth Night, The Tempest, Romeo and Juliet, King John, Richard II, Richard III, Henry V,* and *Coriolanus;* and, if not chosen for study under B, *Julius Caesar, Macbeth,* and *Hamlet.*

Group III. Prose Fiction. Malory: *Morte d' Arthur* (about 100 pages). Bunyan: *Pilgrim's Progress,* Part I. Swift: *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag.) Defoe: *Robinson Crusoe,* Part I. Goldsmith: *Vicar of Wakefield.* Frances Burney: *Evelina.* Scott's novels: any *one.* Jane Austen's novels: any *one.* Maria Edgeworth: *Castle Rackrent,* or *The Absentee.* Dickens's novels: any *one.* Thackeray's novels: any *one.* George Eliot's novels: any *one.* Mrs. Gaskell: *Cranford.* Kingsley: *Westward Ho!* or *Hereward, the Wake.* Reade: *The Cloister and the Hearth.* Blackmore: *Lorna Doone.* Hughes: *Tom Brown's Schooldays..* Stevenson: *Treasure Island,* or *Kidnapped,* or *Master of Ballantrae.* Cooper's novels: any *one.* Poe: selected tales. Hawthorne: *The House of Seven Gables,* or *Twice Told Tales,* or *Mosses from an Old Manse.* A collection of short stories by various standard writers.

Group IV. Essays, Biography, etc. Addison and Steele: *The Sir Roger de Coverley Papers,* or selections from the *Tatler* and *Spectator* (about 200 pages). Boswell: selections from the *Life of Johnson* (about 200 pages). Franklin: *Autobiography.* Irving: selections from *The Sketch Book* (about 200 pages), or *Life of Goldsmith.* Southey: *Life of Nelson.* Lamb: selections from the *Essays of Elia* (about 100 pages). Lockhart: selections from the *Life of Scott* (about 200 pages). Thackeray: lectures on Swift, Addison, and Steele in the *English Humorists.* Macaulay: any one of the following essays—*Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Fredrick the Great, Madame d'Arblay.* Trevelyan: selections from the *Life of Macaulay* (about 200 pages). Ruskin: *Sesame and Lilies,* or selections (about 150 pages). Dana: *Two Years before the Mast.* Lincoln: selections, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, the Letter to Horace Greeley; together with a brief memoir or estimate of Lincoln. Parkman: *The Oregon Trail.* Thoreau: *Walden.* Lowell: selected essays (about 150 pages). Holmes: *The Autocrat of the Breakfast Table.* Stevenson: *An Inland Voyage* and *Travels with a Donkey.* Huxley: *Autobiography* and selections from *Lay Sermons,* including the addresses on *Improving Natural Knowledge, A Liberal Education,* and *A Piece of Chalk.* A collection of essays by Bacon, Lamb, De Quincey, Hazlitt, Emerson, and later writers. A collection of letters by various standard writers.

Group V. Poetry. Palgrave's *Golden Treasury* (First Series):

Books II and III, with special attention to Dryden, Collins, Gray Cowper, and Burns. Palgrave's *Golden Treasury* (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under B). Goldsmith: *The Traveller* and *The Deserted Village.* Pope: *The Rape of the Lock.* A collection of English and Scottish ballads, as, for example, some Robin Hood ballads, *The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens,* and a selection from later ballads. Coleridge: *The Ancient Mariner, Christabel,* and *Kubla Khan.* Byron: *Childe Harold, Canto III or IV,* and *The Prisoner of Chillon.* Scott: *The Lady of the Lake,* or *Marmion.* Macaulay: *The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry.* Tennyson: *The Princess,* or *Gareth and Lynette, Lancelot and Elaine,* and *Passing of Arthur.* Browning: *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, De Gustibus—, Instans Tyrannus.* Arnold: *Sohrab and Rustum,* and *The Forsaken Merman.* Selections from American poetry, with special attention to Poe, Lowell, Longfellow, and Whittier.

[The list for 1913 and 1914 differs in many points from that for 1915-1919. For the 1913 and 1914 list, see the University Catalogue for 1912-1913. The list here given is intended by the National Conference to supersede the previously announced requirements for 1915. Nearly all the publishers of English school texts issue these lists in convenient form, and will send them on application. For the full official report of the 1912 Conference, address Mr. Wilson Farrand, Newark Academy, Newark, N. J.]

B. Study. This part of the requirements is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

Group I. Drama. Shakespeare: *Julius Caesar, Macbeth, Hamlet.*

Group II. Poetry. Milton: *L'Allegro, Il Penseroso,* and either *Comus* or *Lycidas.* Tennyson: *The Coming of Arthur, The Holy Grail,* and *The Passing of Arthur.* The selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's *Golden Treasury* (First Series).

Group III. Oratory. Burke: *Speech on Conciliation with America.* Macaulay's *Speech on Copyright* and Lincoln's *Speech at Cooper Union.* Washington's *Farewell Address* and Webster's *First Bunker Hill Oration.*

Group IV. Essays. Carlyle: *Essay on Burns,* with a selection from Burns's Poems. Macaulay: *Life of Johnson..* Emerson: *Essay on Manners.*"

The Course of Study. The suggested course outlined below covers four years, and each year is divided into two terms.

It provides for the study of grammar, composition, and literature in suitable proportions. It attempts also to assign to a suitable place in the course most of the items in the Conference list of readings. Titles *starred* are recommended for class room study, the others for outside reading. All the literature in the Conference list may well be read in the course of the four years.

Figures following the different subjects indicate the proportion of the whole English time (five periods a week) of the term to be given to each subject. They do not mean that in each week so much time shall be given to grammar, so much to composition, and so much to literature. On the contrary, it is better, both in grammar and in literature, to work intensively, giving consecutive class periods to one topic until it is mastered and then proceeding similarly with another. Drill in the conventional usages of composition, on the other hand, involving as it does the acquiring of habits, should be kept up steadily, alongside of the other studies. The suggested course is as follows:

FIRST YEAR

First Half (Grammar 2, composition 2, literature 1.)

Grammar.—The parts of speech; subject and predicate.

Composition.—Exercises in capitalization, punctuation, and sentence form. Invention, oral and written, in connection with the literature read. Letter-writing.

Literature.—*The Lady of the Lake*; Treasure Island; Arabian Nights; Ivanhoe, Iliad; Tale of Two Cities; Last of the Mohicans; Old Testament Stories* (H. M. Co.).

Second Half. (Grammar 3, composition 1, literature 1.)

Grammar.—Number; case and case relations; transitive and intransitive verbs; complements of the verb; tense; passive voice; compound verb-forms; sentence, clause, and phrase; relatives.

Composition.—Exercises in punctuation and sentence-form continued. Paragraph division and paragraph development. Original work in narration and description on subjects suggested by the literature read.

Literature.—*Vision of Sir Launfal*; Snow-Bound*; Odyssey; Kidnapped;* Lamb's *Tales from Shakespeare; Rip Van Winkle;* Franklin's *Autobiography; Quentin Durward; Robinson Crusoe.*

SECOND YEAR

First Half. (Grammar ½, composition 2, literature 2½.)

Grammar.—Classification of sentences (simple, complex, compound; declarative, interrogative, exclamatory.)

Composition.—Exercises in sentence form, punctuation, and vocabulary. Correction of vulgar errors of speech and writing. Unity and coherence of paragraphs. Invention, oral and written, on topics drawn from the pupil's experience.

Literature.—*As You Like It*; Merchant of Venice*;* Southey's *Life of Nelson;* Butler's *Gordon* (Macmillan's Men of Action Series); *Kenilworth; The House of the Seven Gables; The Deserted Village.*

Second Half. (Composition 2, literature 3.)

Composition.—Review of punctuation, with special attention to comma, semicolon, full stops, and quotation marks. Constructive exercises in different types of sentence form. Repetitive exercises upon the literature read, to enlarge the vocabulary.

Literature.—*The Ancient Mariner*; The Passing of Arthur*; David Copperfield; Lorna Doone;* the *Aeneid; A Christmas Carol* and *The Chimes; The Cricket on the Hearth; Golden Treasury* III and IV*.

THIRD YEAR.

First Half. (Composition 2, literature 3.)

Composition.—Exercises in invention, descriptive or narrative. The whole composition; its theme (unity), and its plan (sequence). Outlines drawn up, and developed both orally and in writing, on topics drawn either from reading or from experience. Study of the connotation of words.

Literature.—*Midsummer-Night's Dream; Idylls of the King*; Twelfth Night; Sketch Book; Succession of Forest Trees*; Travels with a Donkey; DeCoverley Papers; The Tempest; The Black Arrow; Esther; Ruth.*

Second Half. (Grammar 1, composition 2, literature 2.)

Grammar.—Mood and the modal auxiliaries; the participle and the infinitive.

Composition.—Exercises in invention, expository and argumentative. The making of outlines by analysis of propositions; paratopic-sentences and their development; transitions; emphasis by arrangement; how to gather material from experience, observation, reading, and reflection; the right use of reading in original composition; the MS. conventions of citation, quotation, and reference; accuracy of diction.

Literature.—*Pied Piper* and Browning's shorter poems*; Washington's *Farewell Address;* Webster's *First Bunker Hill Oration;* Parkman's *Oregon Trail; Golden Treasury II*;* Selections from Lincoln; *Dr. Jekyll and Mr. Hyde; Genesis, Exodus, Joshua,* and *Judges.*

FOURTH YEAR

First Half. (Grammar 1, composition 1, literature 3.)

Grammar.—General review of sentence analysis; idioms and vulgarisms; principles of etymology.

Composition.—Original written work confirming the principles and methods learned in the third year, with special attention to vocabulary and thought development.

Literature.—History of English literature to Milton; *Macbeth*; Henry V; L'Allegro*; Il Penseroso*; Lycidas*;* selections from Wordsworth and Burns; Plato's *Apology* (Paul More's translation, Houghton, Mifflin), *Crito,* and *Phaedo; Autocrat of the Breakfast Table;* De Quincey's *Joan of Arc* and *The English Mail Coach*.*

Second Half. (Composition 1, literature 4.)

Composition.—Review of the mechanics of written form and the chief details of good use, with drill as found necessary. Rhetorical types of sentences. Original written work based on study and reflection; oral debate.

Literature.—History of English literature from Milton to the present; *Beowulf* (in translation); *Golden Treasury I*; Julius Caesar*; Henry VIII; Cotter's Saturday Night;* Carlyle's *Burns; Tintern Abbey*; Walden;* Burke's *Speech on Conciliation with the Colonies*; The Scarlet Letter; Romola.*

For library equipment, see pages 84-89.

MATHEMATICS

FOUR UNITS MAY BE OFFERED

The four units which may be offered in mathematics are as follows:

Algebra. One unit. Elementary Algebra, including the topics usually presented up to and including the solution of quadratic equations by factoring. The following modifications are recommended, but the omissions from the traditional treatment should not be made without a compensating insertion of work to stimulate actual thinking about the mathematical aspects of concrete things. To assist in this, is the purpose of these suggestions.

The four fundamental operations may be carried out only on arithmetical numbers and on algebraic expressions not longer than trinomials.

Factoring may be limited to forms of the types, the difference of two squares, the square of a sum or of a difference, and monominal factors.

In fractions, the work may be limited to examples, the terms of which are not longer than trinomials, and complicated complex fractions may be omitted; but the interpretations of the rules of Arithmetic in algebraic symbols with a review of arithmetical problems should be included.

Square root may be limited to square roots of arithmetical numbers, monomials, and the squares of binomials, and cube root may be limited to arithmetical numbers and monomials. This should be accompanied by explicit numerical calculations, application to mensuration, and if possible, the construction and use of small tables of squares and square roots.

Exponents may be limited to positive integral exponents below 10, but should include such illustrations as arise in the mensuration formulas of Geometry. The actual working of a slide rule without any theory of logarithms may be shown to students in this connection.

Linear and simultaneous linear equations may be limited to two equations in two unknowns, with emphasis on one equation in one unknown. As great a variety of practical problems of the usual types as is possible, and practical problems of Arithmetic by algebraic methods, should be given. For example, the study of isolated numerical problems in percentage can never give the student complete control of percentage, unless that student has unusual powers of generalization. The statement of the general principle underlying percentage is fundamentally algebraic, and this topic should be treated in algebraic formulation as a standard part of the course. This applies not only to percentage, but to every topic in which general formulation of a principle is possible. What is suggested for percentage should be done also for fractions, for proportion, for mensuration rules, etc. The practical problems should include, also, applications of such rules as the rule of the lever, problems on speed, etc.

Quadratic equations may be limited to the solution of numerical examples by factoring; but should include numerous problems stated in English, and such applications as Geometry affords, including the Pythagorean theorem, or those dependent on the falling body formulas.

Graphical processes should begin with graphical representations of quantities by straight lines, circles or other areas, as in representations of statistics, in encyclopedias, geographies, and in many advertisements. They should include, also, the representation of negative quantities, with such illustrations as are afforded by the thermometer, the representation of statistics, and graphs of linear and quadratic equations. With this should be combined the study of variation of quantities, and the dependence of one quantity upon another by any type of formula.

Algebra. One and one-half Units. Complete elements of Algebra including the above and also the following: the solution of quadratic equations by completing the square, with emphasis only on those examples where the roots are real; simultaneous quadratics only in a few simple examples that can readily be illustrated by graphs, with emphasis only on the cases where one equation is linear; the binomial theorem for positive integral exponents, with emphasis only on the cases where the exponent is less than five; ratio and proportion only in the sense of fractional equations, including, however, graphical representation of two variable quantities, one of which is proportional to the other; arithmetic and geometric progression in the usual sense; practical use of logarithms restricted to the base 10, and emphasizing the use of a table (preferably four place— see bibliography listed under "library equipment") ; fractional and negative exponents with special reference to logarithms, accompanied, if possible, by the practical use of the slide rule (see bibliography listed under "library equipment") ; and those practical problems in which quantities raised to fractional powers occur.

Plane Geometry. One unit. The work in Plane Geometry, in order to be acceptable, must cover a full year in some good text. Teachers are urged to avoid the error that has crept into our traditional courses in Geometry of emphasizing the mere forms of logic at the expense of *geometric thinking.* The main subject-matter of the course should not be the methods by which the conclusions are reached. Proofs should be given, but the proof should not be made the end. Rather, the fundamental aim should be to enable the student to see the geometric truths in any geometric figure quickly and to appreciate their significance.

It is recommended that strong emphasis be placed on a very few of the most important theorems, such as the congruence theorems, the similarity theorems, the Pythagorean theorem, etc., and that the student be led to see that he need not remember many of the lesser theorems, provided he knows how to get them by reference to these larger theorems, whenever he wants them. The student should thus see that the logic of the subject plays a large part in assisting the memory and in relieving the memory from unnecessary burdens. Original demonstrations should form an important part of the work.

It is recommended that informal proofs be accepted for some of the most obvious theorems and that the notion of a strictly logical proof be developed gradually, as the student can be led to see the need for such proof. The theory of limits and the proofs for the incommensurable cases may be omitted or only briefly explained by the teacher.

It is recommended that part of the year be spent on the applications of Algebra to Geometry and of Geometry to Algebra. The connection between Algebra and Geometry now established in the graphical and concrete work in Algebra should not be forgotten. The student's knowledge of Algebra may be kept alive and even slightly extended, and his appreciation of its value greatly strengthened, by frequent incidental use of it throughout the course in Geometry.

It is very desirable that the student should gain in the grades and in connection with the concrete work in Algebra an intimate acquaintance with the objects dealt with in Geometry, and with many of the facts of Geometry, in order that when the regular work in this subject is taken up, it may not be wholly novel to him.

A specially favorable opportunity to make Geometry seem of real value to the student consists in the applications of the theorems on similar triangles to the graphical solution of triangles by drawing them to scale and measuring the unknown parts with ruler and protractor. In this connection, the simplest notions of Trigonometry may be introduced with profit. A small ten cent table of logarithms and trigonometric functions may be obtained (see the bibliography listed under "library equipment"). Familiarity with such a table will do much to enliven the work and incidentally pave the way for an easier understanding of Trigonometry.

For a detailed discussion of these questions, see the report on Geometry which was presented to the National Educational Association in the summer of 1912. This report was issued in a separate pamphlet accompanying the proceedings of the N. E. A. for 1912; a preliminary report was printed in "School Science and Mathematics," 1911, and the final report was reprinted in "The Mathematics Teacher," Dec., 1912.

Arithmetic. One-half Unit. This half unit will not be approved unless it is given after the completion of the elementary courses in Algebra and Geometry. This work in Arithmetic should not be divorced from Algebra and Geometry. Rather the use of principles of Algebra and Geometry should be encouraged, so that the whole point of view in this course can be made more mature and more general than the elementary course in Arithmetic in the graded school. On the other hand, Algebraic and Geometric work should be done only as it is really valuable. Extended variety of topics is by no means so desirable as a careful study of the meaning of the simpler and more fundamental processes of Arithmetic together with application to problems drawn as widely as possible from Geometry, Physics, mensuration, business and other subjects with which the student is already familiar.

Topics deserving special attention are the following:

The fundamental processes on fractions should be accompanied by a statement of the general principles in algebraic form. Percentage should be clearly shown to be a special case of fractions, and its general principles should be presented in algebraic formulation.

Square root should be accompanied by practical computation emphasizing its applications in mensuration; and the student should be encouraged to use tables of squares, square roots, cubes and cube roots, if such tables are available.

Practical problems that involve the use of actual plans of houses and diagrams of machinery, which can be obtained freely from firms of architects and firms of machinery manufacturers, should be used, if possible.

Business forms should include forms of checks, notes, drafts, etc. Special attention is called to the value of a study of interest tables, insurance rate books, tables of freight rates, postal rates, etc.

For reference, as a source of material for problems, and on account of useful tables they contain the library should be supplied with at least one standard engineers' handbook (see bibliography listed under "library equipment"), and with such a book as the New York World Almanac. Some such material is available also in large encyclopedias.

The high school should own also at least one standard slide rule of not less than 8 inches in length, and a protractor. The laboratory of Physics may supply such instruments as the vernier caliper, whose use should be made clear in this course, even if the student has had no laboratory work.

An effort should be made to explain other mathematical instruments in commercial use, such as water meters, light meters, cyclometers, adding machines; and samples of such devices should be added to the equipment of the school as opportunity affords.

Algebra. Additional one-half unit. This half unit will not be approved unless it is given after the completion of the elementary course in Algebra and Geometry. The course should follow the general spirit of the courses outlined above, but it should cover the more technical phases of Algebra omitted in what precedes. Thus factoring should be extended to such forms as the sum of the nth powers of two quantities ($X^n + Y^n$), the factor theorem and the remainder theorem.

The technique of the four fundamental operations and fractions should be improved by considerable drill work, using polynomials of greater length, and literal co-efficients. The work in linear equations should include three equations in three unknowns; the work in quadratic equations should include the properties of the roots of quadratics and the solution of the simpler cases of simultaneous quadratics.

The work in exponents should cover operations with literal exponents and the theory of logarithms to any base. The course should cover also the solution of equations of higher degree by graphical methods, and the general case of the binomial theorem for positive integral exponents, together with other simple cases of algebraic induction.

Any high school text not intended principally for first year work will include these topics, but scarcely any omission can be made in the usual book, if two units are to be approved.

Solid Geometry. One-half unit. The work in Solid Geometry should cover a full half year's work. The logical side of the work may be somewhat subordinated, thoroughly emphasizing the question of space intuition and the more important mensuration formulas. The student's space conception may well be aided by the construction and study of models, and by the experimental verification of formulas.

Trigonometry. One-half unit. This is supposed to cover a half year's work. The ability to solve a right triangle and any oblique triangle by dividing it into right triangles without using logarithms should be emphasized above everything else. The ability to read tables, to interpolate properly, and the ability to use tables of any kind that may be presented, is very important. The knowledge of logarithms and logarithmic methods of solution is of importance only secondary to the things mentioned above. Such other topics, as the formulas involving two angles, should be treated at least briefly.

For library equipment, see pages 89-90.

HISTORY

FOUR UNITS MAY BE OFFERED

The course of study recommended consists of a full year's work, five periods a week of forty minutes each, in each of the four fields of history—Ancient, Medieval and Modern, English, and American. In order to develop in the pupils the sense of historical unity and growth, the course of study should be so planned as to have one period or field succeed another in natural sequence. Accordingly, the course should begin with a year's work in Ancient History and this be followed by a second year devoted to Medieval and Modern History. The third year will, naturally, be devoted to English History, and the fourth to American History and American Government. If desired, English History may be given in the second year and Medieval and Modern in the third year, without seriously affecting the continuity or value of the instruction. A reason for such transposition may be found in the relative difficulty of the two courses, both from the teacher's and pupil's standpoints.

For a three years' course of study, Ancient History should be followed in the second year by Medieval and Modern History, with attention to English History as a part of the field, or by English History, with attention given to continental European history, and in the third or fourth year American History, or American History and American Government, should be studied.

A two years' course should comprise a year's work in Ancient History followed by a year of Medieval and Modern History. Such a brief course, however, is not recommended, and accredited schools offering but two units should make every effort to add another year's work in history to their programme, or, better still, two years additional.

The following brief statements with regard to the several units will serve to indicate the scope of the course and the type of text-books that should be used.

Ancient History. One unit. The completion of a careful and thorough course of study extending over one entire school year in ancient Oriental, Greek, and Roman history. The list following will indicate the type of books that should be used as the basis for this course: Botsford, *History of the Ancient World,* Macmillan; Goodspeed, *History of the Ancient World,* Scribner; Morey, *Outline of Ancient History,* American Book Co.; Myers, *Ancient History* (Rev. Ed.) Ginn; West, *The Ancient World,* Allyn & Bacon; Westermann, *Story of the Ancient Nations,* Appleton; Wolfson, *Essentials in Ancient History,* American Book Co.

Medieval and Modern History. One unit. A year's study of the history of the European nations and their development and institutions from the period of the Germanic invasions to the close of the nineteenth century. The course should be based on a standard high school text such as: Adams, *Mediaeval and Modern History,* Macmillan; Bourne, *Mediaeval and Modern History,* Longmans, Green; Harding, *Essentials in Mediaeval and Modern History,* American Book Co.; Munro and Whitcomb, *Mediaeval and Modern History,* Appleton; Myers, *Mediaeval and Modern History* (Rev. Ed.) Ginn; Robinson, *History of Western Europe,* Ginn; Thatcher and Schwill, General History of Europe, 350—1900 A. D., Scribner; West, *Modern History,* Allyn & Bacon.

English History. One unit. A thorough study of English political, governmental, economic and social history extending through one full school year and based on any standard text-book such as: Andrews, *History of England,* Allyn & Bacon; Cheyney, *Short History of England,* Ginn; Coman and Kendall, *History of England,* Macmillan; Larned, *History of England,* Houghton, Mifflin; Terry, *History of England for Schools,* Scott, Foresman (Chicago); Tout, *Advanced History of England,* Longmans, Green; Walker, *Essentials in English History,* American Book Co.; Wrong, *History of the British Nation,* Appleton.

Note.—A half unit in English History will be given for a shorter course of study based on less advanced texts such as Higginson and Channing's *History of England;* Ransome's *Short History of England,* and Montgomery's *English History.* The half-unit course is not recommended, however, and the half-unit course should be given only when it is impossible to devote a full year to the subject.

American History. One unit. This course should embrace a year of advanced work in American political, social and institutional history with special reference to the period since 1763. The following textbooks suggest a standard for this course: Adams and Trent, *History of the United States,* Allyn & Bacon; Ashley, *American History,* Macmillan; Channing, *Student's History of the United States,* Macmillan; Hart, *Essentials of American History,* American Book Co.; James & Sanford, *History of the United States,* Scribners; Larned, *History of the United States,* Houghton, Mufflin; McLaughlin and Van Tyne, *History of the United States,* Appleton; Montgomery, *Student's American History,* (Rev. Ed.) Ginn; Muzzey, *American History,* Ginn; Woodburn and Moran, *American History and Government,* Longmans, Green.

Note.—A half-unit in American History will be given for a briefer, or half year, course of an advanced character but less comprehensive in scope. Such a course is not recommended, however, save in connection with the half-unit in American Government.

For list of maps and library equipment, see pages 90-102.

AMERICAN GOVERNMENT (CIVIL GOVERNMENT)

ONE-HALF UNIT MAY BE OFFERED

Course of Study. Systematic instruction in American Government should be postponed to the last year of the course of the secondary school. There is a distinct advantage in this plan. If given in the earlier years the work would be largely a review of what had been done in the last year of the elementary school. Still more important is the consideration that the senior in the secondary school is a much better subject for such instruction than are pupils in the first and second years. He will be much more appreciative of the spirit and content of the course.

American Government should be given as a distinct course and not as a part of the work in American History. History, however, is so essential to good results in the teaching of government that credit will not be given for work in American Government unless it is preceded by at least one-half year's work in American History. The best plan is to offer American Government in the second half of the senior year following American History in the first half of such year. It is recommended, moreover, that during the earlier years of the course much incidental instruction in American Government should accompany the work in History and Geography. Emphasis should be placed upon the historical development of political institutions in order that the pupil may be brought to a true understanding of what may otherwise appear arbitrary and irrational.

Methods of Instruction. The course should begin with a study of local government. The pupil can be made to understand local institutions much more readily than those of the state or nation since the former come within the range of his personal experience. In his daily life he is brought into contact with organs and activities of local government and these should be seized upon by the teacher as object lessons to illustrate the work of the course. The city will furnish the best and most numerous illustrations of this character. It will be relatively an easy matter to excite the curiosity and arouse the interest of the pupil in governmental organs which he can see and whose activities are brought home to him. In this way he will receive a real training in citizenship. From the institutions of the city it will be possible to proceed in like manner to those of the county, state and nation.

The pupil's interest in the work can be retained and heightened by visits to places which have to do with governmental activities. The city hall, public water and lighting plants, the public library, postoffice, the school itself,—all will furnish excellent means for illustrating the work in American Government. The pupil should be encouraged to study the government of his city and make reports upon various phases of its organization and work, e. g., the mayor, city clerk, street improvement, lighting, etc. The work in American Government may also be supplemented by having the school debating societies discuss questions of civic interest.

A good text-book is desirable. In many cases its arrangement may not correspond to the above plan but it will be possible to take up the parts of the text in a different order from that in which they are presented. The text-book must be largely supplemented by the teacher and by collateral reading and reference work. A small reference library is essential.

For library equipment, see pages 102-104.

LATIN

FOUR UNITS MAY BE OFFERED

The student should acquire such a vocabulary and such a knowledge of inflections and syntax as to read readily simple Latin prose with accurate quantitative pronunciation of the words. He should be carefully trained in reading Latin aloud, with proper emphasis and expression, and in rendering Latin into choice, idiomatic English. In addition to the reading, there should be considerable practice throughout the four years in writing Latin, and in making accurate written translations. There should be some sight reading each week after the first year.

The *first year* should be spent in thoroughly mastering the elements of the language as given by such beginners' books as D'Ooge's, Hale's, Bennett's, Collar and Daniell's, or Pearson's.

During the *second year,* four books of Caesar's *Gallic War* should be read. An equivalent of Nepos, Viri Romae, or Eutropius may be substituted for one book of Caesar, if the pupils need some simple Latin as a bridge. This is not recommended, however, unless it is absolutely necessary. An equivalent amount of Caesar's *Civil War* may be read instead of the *Gallic War.* This is recommended especially in the case of classes in which a large number are going over the year's work a second time. The reading should be accompanied by a careful and systematic review of grammatical forms and by a study of the leading principles of syntax. The latter should be impressed upon the pupil's mind by the translation into Latin of English sentences, based upon the text read. One exercise a week should be given entirely to this composition work, in which the marking of all long vowels should be insisted on.

During the *third year* the following orations of Cicero are usually read: four orations against Catiline, the oration for the Manilian Law, the oration for the Poet Archias. Instead of these, an equivalent may be read in Sallust's *Catiline.* The grammar and composition work of the preceding year should be continued.

It is recommended that the *fourth year* be begun by the reading of about a thousand lines of Ovid's *Metamorphoses.* This is to be followed by four or five books of Vergil's *Aeneid,* including the Sixth Book. If only four are read, about eight hundred lines from the *Eclogues* or *Georgics* should be read. If desired the whole year may be devoted to reading six books of the *Aeneid.* The technique of the Latin hexameter should be taught and its rhythm should be felt as quantitative and not merely translated into an accentual rhythm.

In connection with the reading of Latin, the mythology of the Greeks and Romans and the life and history of the Roman People should be thoroughly taught. The military, constitutional and private customs of the ancients should be carefully worked out by the teacher, who is thus enabled to illumine countless passages for the student. Map drawing by the student serves to impress upon his mind the geography of the ancient world.

For library equipment, see pages 104-112.

GREEK

THREE UNITS MAY BE OFFERED

The *first unit,* consisting of introductory lessons, should include (1) Xenophon's *Anabasis* (20 to 30 pages), (2) practice in reading at sight and in writing Greek, and (3) the beginning of systematic study of grammar.

The *second unit* should include (1) continuation of Xenophon's *Anabasis,* either alone or with other Attic prose (75 to 100 pages); (2)

practice in reading at sight, systematic study of grammar, thorough grammatical review and practice in writing Greek, both based on study of Books I and II of the Anabasis.

The *third unit* should include (1) Attic prose: e. g., Lysias' *Orations,* or Plato's *Apology and Krito,* or Xenophon's *Memorabilia,* with practice in writing Greek, in grammar, and in reading at sight; (2) Homer (2500 to 4000 lines); e. g., *Odyssey* Books I-V, or *Iliad* Books I-III (omitting 11,499-end), and VI-VIII.

Useful text books for the above work are:

1. For the *first year's* work.—Ball's *Elements of Greek,* Macmillan; White's *First Greek Book,* Ginn; Gleason and Atherton's *First Greek Book,* American Book Co.; Gleason's *Gate to the Anabasis,* Ginn.

2. For the *second year's* work.—Mather and Hewitt's *Xenopon's Anabasis,* American Book Co.; Smith & Bonner, *Xenophon's Anabasis,* D. Appleton; Goodwin and White's *Xenophon's Anabasis,* Ginn; Goodwin's *Greek Grammar,* Ginn; Pearson's *Greek Prose Composition,* American Book Co.

3. For the *third year's* work.—Morgan's *Eight Orations of Lysias,* Ginn; Wait's *Ten Select Orations of Lysias,* American Book Co.; Bristol's *Ten Selected Orations of Lysias,* Allyn and Bacon; Adams, *Selected Speeches of Lysias,* American Book Co.; Flagg's *Apology and Krito of Plato,* American Book Co.; Smith's *Xenophon's Memorabilia,* Ginn.

For library equipment, see pages 104-112.

GERMAN

THREE UNITS MAY BE OFFERED

The *first unit* should comprise: (1) Careful drill upon pronunciation. (2) Systematic drill upon the elements of grammar, including the inflection of the articles, the noun, the adjectives, the pronoun, the verb, strong and weak; also upon the use of the common prepositions, the simpler use of the modal auxiliaries and elementary rules of syntax and word-order. (3) Abundant practice (a) in oral and written reproduction of the text, (b) in the memorizing of colloquial and idiomatic phrases, and (c) in dictation.

All reading in this course should be intensive. The pupil should be required to give back the entire subject-matter in German, either in the form of German answers to German questions, repetitions from memory, or free oral or written reproduction. The teacher may use discretion as to the number of pages thus treated. Ordinarily a class cannot treat more than 100 pages in this manner with sufficient thoroughness. Texts such as the following are recommended: Guerber's *Märchen und Erzählungen I, Seeligmann's Altes und Neues, Glück Auf,* the easiest of Grimm's *Marchen,* the texts in Prokosch's *Introduction to German.*

The *second unit* calls for about 300 pages of moderately difficult reading, chiefly prose, with constant practice in oral and written reproduction of selected portions; also drill upon the more difficult chapters of grammar such as the passive voice, use of cases with prepositions, verbs, adjectives, uses of tenses and modes (especially the infinitive and subjunctive), likewise upon word-order, and word-formation. Thoroughness should be insisted upon rather than quantity. The following texts are among those recommended: (1) For reading, Baumbach's *Sommermärchen* and *Waldnovellen,* Leander's *Träumereien,* Zschokke's *Der zerbrochene Krug, Das Wirtshaus zu Cransac,* Storm's *Immensee,* Heyse's *L'Arrabiata;* (2) for composition, Pope's *Writing and Speaking German;* Stern's *Geschichten vom Rhein,* Manley's *Ein Sommer ein Deutschland.*

The *third unit* calls for (1) the reading of 400-500 pages of good modern prose stories and plays, and the ability to use the language effectively as a means of oral and written expression; and (2) abundant practice in the writing of composition. Among the texts recommended are: (narrative) Riehl's *Burg Neideck;* Sudermann's *Frau Sorge;* Storm's *Der Schimmelreiter*: (dramatic) Moser's Der *Bibliothekar;* Freytag's *Die Journalisten;* Helbig's *Komödie auf der Hochschule;* (historical) Sybel's *Die Erhebung Europas;* Schiller's *Der dreiszigjährige Krieg;* Freytag's *Aus dem Jahrhundert des groszen Krieges;* Arndt's *Deutsche Patrioten.* A well-balanced course includes works of all the three classes mentioned.

For library equipment, see pages 112-116.

FRENCH

THREE UNITS MAY BE OFFERED

In general throughout the course the teacher should aim at quality rather than quantity.

First unit. The work of the first year should aim to give the student: (1) an accurate pronunciation; (2) a knowledge of the rudiments of the grammar; (3) the ability to translate simple sentences into French and to express in idiomatic French simple ideas; (4) the ability to understand simple ideas expressed orally in French; (5) a vocabulary and knowledge of construction sufficient to enable him to read ordinary French with considerable ease.

The drill in pronunciation should begin with the first meeting of the class and should continue unremittingly until the last. It is not only an end in itself but it makes for accuracy in the knowledge of grammatical forms and is a great aid in the retention of vocabulary. As a part of such drill frequent dictations are indispensable.

The grammatical work should include the regular and the more common irregular verbs, the inflection of nouns, adjectives, participles, and pronouns, the use of pronouns, adverbs, prepositions, and conjunctions, sentence-order, and the elements of syntax. The amount studied should be about that covered in Thieme and Effinger's *Grammar,* the first part of Fraser and Squair's *Grammar,* Aldrich and Foster's *Elementary French,* or Chardenal's *First French Course.*

A minimum of about 150 pages should be read. There are a number of readers which present a sufficient variety of graded material and some of the easier of the texts mentioned below as suitable for the second year could be used profitably. There should be constant practice in translating into French easy variations of the texts read, and this, in conjunction with the English sentences given in the grammar, will insure an abundance of drill in this respect.

Second unit. The work of the second year should include the reading of a minimum of 350 pages of modern prose, including a number of short dramatic works, with constant practice as before in retranslation of variants of the texts read. The drill in pronunciation and the writing of French from dictation should be continued. The grammar work should include a careful review of the ground covered in the first year, with drill upon all irregular verbs that are not very rare, the uses of the subjunctive, and a more detailed study of the syntax. There should be constant practice in the construction of sentences. Students should be required to give either orally or in writing abstracts of portions of the texts read. Any of the following texts, recommended by the Committee of Twelve of the Modern Language Association of America, are suitable for the second year: About's *Le Roi des Montagnes;* Bruno's *Le Tour de la France;* Daudet's easier short tales; La Bédollière's *La Mère Michel et Son Chat;* Erckmann-Chatrian's stories; Foa's *Contes Biographiques* and *Le Petit Robinson de Paris;* Foncin's *Le Pays de France;* Labiche and Martin's *La Poudre aux Yeux and Le Voyage de M. Perrichon;* Legouvé and Labiche's *La Cigale chez les Fourmis;* Malot's *Sans Famille;* Mairet's *Le Tâche du petit Pierre;* Mérimée's *Colomba;* extracts from Michelet; Sarcey's *Le Siège de Paris;* Verne's stories.

Third unit. The work of the third year should include the reading of from 600 to 1000 pages of French, with constant practice in paraphrasing and abstracting portions of the texts *in French.* The drill in pronunciation and in the writing of French from dictation should be continued unremittingly. A good grammar should be studied carefully. Students should be drilled in writing simple original themes in French. The texts recommended by the Committee of Twelve are as follows: About's stories; Augier and Sandeau's *Le Gendre de M. Poirier;* Béranger's poems; Corneille's *Le Cid* and *Horace;* Coppée's poems; Daudet's *La Belle-Nivernaise;* La Brète's *Mon Oncle et Mon Curé;* Madame de Sévigné's letters; Hugo's *Hernani* and *La Chute;* Labiche's plays; Loti's *Pècheur d'Islande;*

Mignet's historical writings; Molière's *L'Avare* and *Le Bourgeois Gentilhomme;* Racine's *Athalie, Andromaque,* and *Esther;* George Sand's plays and stories; Sandeau's *Mademoiselle de la Seiglière;* Scribe's plays; Thierry's *Récits des Temps Mérovingiens;* Thiers's *L'Expédition de Bonaparte en Egypte;* Vigny's *Canne de Jonc;* Voltaire's historical writings. It is recommended, however, that only sparing use be made of the classical plays, especially those of Corneille and Racine, which are more suitable for a fourth year.

For library equipment, see pages 116-118.

SPANISH

THREE UNITS MAY BE OFFERED

The work in Spanish should aim at a combination of the practical and the esthetic. Emphasis throughout the course should be laid on beauty of expression, the characteristic tone of Spanish literature, historical and literary references, on the one hand, and a sure grasp of grammatical principles, thorough drill in verbs, and independent expression, both oral and written, on the other.

First unit. The instruction should above all be practical. Drill in variety should be the method, and thoroughness, the object. Students, on finishing this course, should be able to read easy texts like Hill's *Spanish Tales for Beginners* (Holt), Valera's *El Pájaro verde* (Ginn), and Carrión and Vital Aza's *Zaragüeta* (Silver, Burdett). About 150 pages of connected prose should be read. Exercises in the memorizing of vocabulary should be given frequently. A small portion of each period should be devoted to pronunciation and dictation. The conversational method should be employed as soon as possible and gradually enlarged in its application. For this purpose, a rather limited every-day vocabulary dealing with objects of common use, and Spanish and Latin-American life and customs should be compiled and put into practice, preferably in the form of short, rapid questions and answers. Nutt's *English-Spanish Conversation Dictionary* (Ritter and Flebbe, Boston) will be found helpful. Grammars recommended are Wagner's (Third Edition, Ann Arbor Press), Olmsted and Gordon's (Holt), Hills and Ford's (Heath). In composition work, any ten sentences illustrating each lesson should be sufficient.

Second unit. A rapid review of the grammar, along with the writing of all composition work, should be made. The class-room work should be carried on as largely as possible in Spanish. The reading of about 350 pages of modern prose, such as that of Galdós' *Marianela* (Heath), Valera's *El Comendador Mendoza* (Amer. Book Co.), Moratín's *El Sí de las Niñas* (Amer. Book Co.), is required. Some attention should be paid to literary qualities. Crawford's *Spanish Composition* (Holt) or an equivalent, should be used both for composition and conversation. The *Boletín* *de la Unión Panamericana* (Washington, D. C.) will prove of interest and value to students.

Third unit. Some of the more difficult masterpieces should be taken up, and considerable time devoted to their value as literature. Pupils should be referred to good histories of Spanish literature, such as Fitzmaurice-Kelly's or Ticknor's. Three or four works of the caliber and length of Galdós' *Doña Perfecta* (Heath), Núñez de Arce's *El Haz de Leña* (Heath), Ford's *Selections from Don Quijote* (Heath), and Calderón's *La Vida es Sueño* (Amer. Book Co.) should be read. Umphrey's *Spanish Prose Composition* (Amer. Book Co.) is suitably graded for this year. The ability to converse should be developed. For grammatical reference, Ramsey's unabridged *Text-book of Modern Spanish* (Holt), and Bello y Cuervo, *Gramática de la Lengua Castellana* (A. Rogers), Paris, are suggested.

For library equipment, see page 118.

PHYSICS

TWO UNITS MAY BE OFFERED

The work of the *first unit* consists of three closely related parts; namely, class work, lecture-demonstration work, and laboratory work.

The class work includes the study of at least one standard text. It should aim to build up in the pupil's mind clear concepts of physical terms and quantities, and an intuitive appreciation of the general principles which make up the syllabus given below. The pupil should be trained in the use of those principles in the solution of simple, practical, concrete numerical problems.

In the laboratory, the pupil should perform at least thirty individual experiments, and should keep a careful note book record of them. At least twenty of these should involve numerical work and the determination of such quantitative relations as may be expressed in whole numbers. Such quantitative work should aim to foster the habit of thinking quantitatively, but should not attempt to verify laws with minute accuracy nor to determine known physical constants with elaborate apparatus. The list of topics covered by these quantitative experiments ought not to differ widely from the list of starred topics in the syllabus.

The teacher is not expected to follow the order of topics in the syllabus, unless he wishes to do so. The list is not intended to include all the material for the year's work. It is purposely made short, in order that each teacher may be free to supplement it in a way that fits his individual environment. It does include those topics which all agree are essential to a first course in Physics, and which are capable of comprehension by boys and girls of high school age.

The syllabus of topics is as follows:

*1. Weight, center of gravity.
*2. Density.
*3. Parallelogram of forces.
4. Atmospheric pressure; barometer.
*5. Boyle's law.
6. Pressure due to gravity in liquids with a free surface; varying depth, density, and shape of vessel.
*7. Buoyancy; Archimedes' principle.
*8. Pascal's law; hydraulic press.
9. Work as force times distance, and its measurement in foot-pounds and gram-centimeters.
10. Energy measured by work.
*11. Law of machines: work obtained not greater than work put in; efficiency.
*12. Inclined plane.
*13. Pulleys, wheel and axle.
*14. Measurement of moments by the product of force times arm; levers.
15. Thermometers: Fahrenheit and Centigrade scales.
16. Heat quantity and its measurement in gram calories.
*17. Specific heat.
*18. Evaporation; heat of vaporization of water.
*19. Dew point; clouds and rain.
*20. Fusion and solidification; heat of fusion.
21. Heat transference by conduction and convection.
22. Heat transference by radiation.
23. Qualitative description of the transfer of energy by waves.
24. Wave length and period of waves.
25. Sound originates at a vibrating body and is transmitted by waves in air.
*26. Pitch and period of sound.
*27. Relation between the wave length of a tone and the length of a string or organ pipe.
*28. Resonance.
29. Beats.
30. Rectilinear propagation of light; pin-hole camera.
*31. Reflection and its laws; image in a plane mirror.
*32. Refraction, and its use in lenses; the eye, the camera.
*33. Prisms and dispersion.
34. Velocity of light.
35. Magnetic attractions and repulsions.
*36. Field of force about a magnet.
37. The earth a magnet; compass.
38. Electricity by friction.

39. Conductors and insulators.
*40. Simple galvanic cell.
*41. Electrolysis; definition of the ampere.
*42. Heating effects; resistence; definition of the ohm.
*43. Ohm's law; definition of the volt.
*44. Magnetic field about a current; electromagnets.
*45. Electromagnetic induction.
*46. Simple alternating current dynamo of one loop.
*47. Electromagnetic induction by breaking a circuit; primary and secondary.
48. Conservation of energy.

The notebook should be a concise record of what the pupil has done. The data should be so tabulated that any one familiar with the subject, or the pupil himself some months later, will be able to understand just what was done. It should be neat, clear and accurate, but the notebook is not the object of the course and too much time should not be put on it.

The text-book should be equal in grade to one of the following: Adams, American Book Co.; Carhart & Chute, Allyn & Bacon; Coleman, Heath; Hoadley, American Book Co.; Mann and Twiss, Scott, Foresman; Millikan and Gale, Ginn; Mumper, American Book Co.

For the laboratory it is advisable to use a laboratory manual separate from the text-book. There are now a number of excellent manuals published. The use of one of these will in general be much more satisfactory than notes which must be copied by the pupils. The following manuals are suggested: Adams, American Book Co.; Crew and Tatnall, Macmillan; Coleman, American Book Co.; Hoadley, American Book Co.; Nichols, Smith and Turton, Ginn; Millikan and Gale, Ginn; Reeve, American Book Co.; Twiss, Scott, Foresman.

A *second unit* may be given, consisting of a continuation of the laboratory work for another year, or a year's work in a more advanced text together with laboratory work.

For laboratory equipment, see pages 57-61.
For library equipment, see pages 118-119.

CHEMISTRY

TWO UNITS MAY BE OFFERED

The *first unit* should consist of a year's work as outlined in a standard text-book of high school grade. It should consist of two closely related parts; namely, recitations including demonstrations by the teacher, and laboratory work.

Each pupil should be provided with an outfit of apparatus for the laboratory exercises, which should be largely carried out by the pupils working independently. A limited number of experiments, however, may be conducted by two pupils working together. Each pupil should record in a note book what he observes, and should do so at the time the observations are made. The interpretation of observed results and calculations may be recorded in the note book later, if the teacher so prefers.

As Chemistry is an art as well as a science, stress should be laid on handling and setting up apparatus in a neat and orderly manner. In the use of reagents, thought should be given to proportions, and the wasting of materials should be prevented. In experimentation, careful planning and skill of the hand should be emphasized. In this way the laboratory work becomes an interacting process of thinking, doing, and thinking. The pupils, for example, should know why an apparatus should be air tight and how to make it air tight; why gases are washed and dried, and how this operation must be done.

The text and reference books, as a rule, furnish an adequate and systematic account of the chemical changes selected for study, but the equally important feature of the course, the art of Chemistry, is imparted directly by the teacher.

In both laboratory and class work, the materials chosen for study should be restricted to a relatively small number of elements and their chief compounds. Interest in the work may be increased by applications of the facts and generalizations of the text to familiar phenomena in daily life. Visits should be made to the gas works, ice plant, lime kiln, and other chemical industries in the locality. The more important discoveries of Chemistry should become associated with the great masters of the science by anecdote, personal characteristics, or contemporary events.

A *second unit* may be given, consisting of more advanced work in the subject, during the same length of time as required for the first unit.

For laboratory equipment, see pages 61-65.
For library equipment, see pages 119-120.

GENERAL BIOLOGY

ONE UNIT MAY BE OFFERED

This course should be designed to present a general survey of biological science, including the life processes, the activities, the adaptations, as well as the structure of organisms, treated from the standpoint of their general relations. General Biology is the study of the fundamental properties of living things, as illustrated by a carefully selected series of both animal and plant forms.

The laboratory work guided by suitable directions, should precede textbook work on any subject, and the pupil should be required to make careful drawings and notes on all observations. Accurate observations and records of the normal activities of living animals and plants should be made whenever practicable, both in the laboratory and in the field. Simple experiments upon the behavior of animals are very valuable, and should be made if possible.

The following series of forms for study is suggested: (1) amoeba; (2) paramoecium or vorticella; (3) haematococcus; (4) yeast plant; (5) spirogyra; (6) hydra; (7) mucor or penicillium; (8) earthworm; (9) crayfish; (10) grasshopper; (11) fern; (12) fresh water mussel; (13) seeds and seedlings; (14) flowering plant; (15) frog, with metamorphosis. Hunter's *Elements of Biology* is a good text for this work.

For laboratory equipment, see pages 65-68.
For library equipment, see pages 120-126.

BOTANY

TWO UNITS MAY BE OFFERED

The work of the *first unit* should deal, for the most part, with the seed plants, and should consist of recitations, laboratory work and field studies. While the study of structure is essential, yet most emphasis should be placed on the activities of plants. The studies with lower plants should deal almost entirely with gross structures, life habits and economic importance.

The following topics are suggested:

General Studies with Seed Plants.—(1) The parts of a mature plant—roots, stem, leaves, flower. (2) The functions of roots and their modifications. (3) The functions of stems and their modifications. (4) Buds. (5) Leaves and their work. (6) Flowers, parts, functions, adaptations for pollination. (7) Fruits, kinds, adaptations for dispersal, value to man. (8) Seeds, structure, germination, etc. (9) Relation of plants to light, soil, water, atmosphere. (10) Plant families, studies of common representatives of the important plant families, as the roses, legumes, grasses, lilies, composites, etc. Forests and forest trees may well be considered here.

Studies with Lower Plants.—(1) Algae, general appearance, abundance, local distribution, and relation to water supplies. (2) Bacteria, relation to decay, to soils, to disease in plants and animals, to purity of milk and water supplies, to public hygiene. (3) Molds, appearance, occurrence, importance in relation to food products. (4) Yeasts and fermentation. (5) Rusts, smuts, etc., as the cause of plant diseases, parasitic method of living, control of plant diseases. (6) Mushrooms, edible and poisonous, cultivation, agents in destruction of timber. (7) Liverwort, habits, distribution and life cycle. (8) Moss, habits, distribution and life cycle. (9) Fern, life cycle, distribution, local types.

Careful drawings, notes, and deductions should be made. The student should make his own studies first and then read his text.

This outline is not intended as an essential arrangement, for the latter is best determined by convenience. Any arrangement, however, should enlist the interest of the pupil in the living plant—the plant in action—and laboratory studies should be made to bear this out. It is better, also, to omit some of the topics suggested than to treat them inadequately. The teacher must determine the apportionment of time, and bring out the connection of the topics.

The *second unit* should cover essentially the same ground as is taken up in Coulter's *Plant Structures,* or Bergen and Davis' *Principles of Botany,* Part II, dealing with the morphology, evolution and classification of plants. A careful laboratory study of types of the great groups of plants should be made. The forms selected should be considered largely from the standpoint of evolution.

For laboratory equipment, see pages 65-68.
For library equipment, see pages 120-126.

ZOOLOGY

TWO UNITS MAY BE OFFERED

The study of each form should include a consideration of the following: (1) habitat; (2) geographical distribution; (3) food; (4) adaptations to environment, including relations to other forms of animal and plant life; (5) general activities; (6) economic relations; (7) life history, and (8) structure.

In Zoology the same methods of instruction should be followed as are outlined above under General Biology.

For the *first unit,* the following series of forms for study is suggested:—(1) Protozoa (amoeba, and paramoecium or vorticella). (2) A coelenterate, (hydra). (3) An echinoderm (starfish or sea-urchin). (4) An annelid worm (earthworm). (5) A parasitic worm (cestode or trematode). (6) A decapod crustacean (crayfish). (7) An orthopterous insect (grasshopper, and comparison with other orthoptera). (8) A coleopterous insect. (9) A lepidopterous insect, with *larva and pupa.* (10) A hymenopterous insect. (11) A pelecypod mollusc (fresh water mussel). (12) An amphibian (frog, with metamorphosis).

For high schools equipped to do thoroughly satisfactory work in Zoology, Linville and Kelly's *A Text-book in General Zoology* is recommended.

A *second unit* may be given, consisting of more advanced work in the subject, with a study of additional forms, during the same length of time as required for the first unit.

For laboratory equipment, see pages 65-68.
For library equipment, see pages 120-126.

PHYSIOLOGY

ONE UNIT MAY BE OFFERED

It is recommended that Physiology be preceded by a course in General Biology, or by a course either in Zoology or in Botany. At least two double periods a week should be given to laboratory demonstrations by the instructor and to dissections and physiological experiments performed by the student, always under careful supervision. In the high school Physiology course, a certain amount of time should be given to the anatomical study of structures which are to be used later for physiological experiment and demonstration; but the structures should be studied primarily for the sake of a better understanding of the functions. Careful notes and drawings of the structures dissected should be preserved for use as guides later in making physiological preparations. The laboratory experiments performed on the living organs and tissues should include tests to show the characteristics of muscular contraction, nerve irritability, blood pressure, the heart beat, the pulse, the capillary circulation, etc. Note books should be kept in connection with all physiological demonstrations. The notes should indicate the specific observations with regard to the living organs, and should show the results obtained from the study of mechanical records of such phenomena as occur too rapidly for direct observation. It is recommended that the elementary phases of physiological chemistry be presented in the subject of digestion, secretion, blood clotting, and the composition of one or two tissues. The original laboratory notes taken at the time of the experiment should be preserved.

The text-books and printed guides are numerous and a judicious amount of selection and elimination is necessary. Of the better high school texts may be mentioned, Martin's *Human Body,* revised edition; Hough and Sedgwick's, *The Human Mechanism;* Huxley's *Lessons in Elementary Physiology,* revised edition; Schenck and Guber's *Human Physiology,* translated by Zoethout; Hewe's *High School Physiology,* which has directions and suggestions for laboratory experiments; Walter's *Physiology* and *Hygiene.*

For laboratory equipment, see pages 68-69.
For library equipment, see pages 126-127.

PHYSICAL GEOGRAPHY

ONE UNIT MAY BE OFFERED

The following outline includes only the more essential facts and principles of a unit course:

Mathematical Geography.—(1) Review of subject as presented in grammar school geography, including construction of diagrams to show inclination of the earth's axis to the plane of its orbit, perihelion and aphelion, position of equinox and solstice; measurement of sun's altitude by means of sun board; determination of latitude by measuring altitude of pole star. (2) The earth considered as a planet: rotation, proofs, results; revolution, proofs, results; magnetism, compass, poles, variation.

The Atmosphere.—Composition, extent and offices of the atmosphere. (2) Temperature: source of temperature; variation of temperature; isotherms; isothermal charts of the world for January and July. (3) Pressure: measurements of pressure; relation of pressure to temperature; study of isobars on United States weather map; distribution of pressure; relation of isobars to isotherms. (4) Atmospheric moisture: source; amount; how measured. (5) Atmospheric movements: winds, classes, direction, cause; special study of character and paths of storms in the United States. (6) Weather and climate; use of weather maps.

The Land.—(1) Earth materials: study of the common rocks and rock forming minerals; more detailed study of the rocks and soils of the locality. (2) Land forms, including, after the student has first been taught to interpret the Geological Survey Maps, a study of the following types of topography, illustrated by the maps: plains, simple plain, a plain with valleys, a plain with hills, a plain with hills and valleys; plateaus, simple plateau, plateau with valleys, plateau with hills, a plateau with hills and valleys; mountains, a simple mountain, a mountain with valleys. (3) Weathering: conditions affecting weathering; weathering agents; transportation of material; results of weathering. (4) Special study of the valley: including birth of valley; how it grows; how it gets a stream; limits of growth; accidents that may happen to valleys. (5) Ground water: source; amount; use. (6) The work of streams. (7) Work of ice: lake ice, river ice, seashore ice, snow line, snow fields, local and permanent; formation of glacial ice, glacial movements, types of glaciers, work of glaciers, icebergs. (8) The ancient ice sheet: evidence of its existence; how it developed; extent; center of dispersion; unglaciated areas; changes produced by erosion and deposition of material; characteristics of glaciated areas of United States.

Volcanoes and Volcanic Phenomena.—(1) General facts, kind and distribution. (2) Study of cone, dyke, crater, fissure, lava.

The Ocean.—(1) Form, divisions and general characteristics of the ocean. (2) Depth, density, temperature and composition of ocean waters. (3) Characterstics of ocean floor. (4) Distribution of life in ocean. (5) Movements of ocean water; waves, cause and effect; currents, causes and effects; more important currents; tides, character, cause. (6) Special study of shore lines.

The Earth and Man.—Relation of man, plants and animals to climate, land forms and ocean areas.

For laboratory equipment, see pages 69-73.
For library equipment, see pages 127-128.

AGRICULTURE

ONE UNIT MAY BE OFFERED

The work should consist of two parts, (1) individual laboratory and field work, and (2) recitations based upon the laboratory work, the text-book and assigned readings. Three periods a week should be given to the recitation and not less than two eighty-minute periods a week to laboratory and field work. As a rule, the laboratory and field work should precede rather than follow the recitation. Every school should have a small plat of ground, an acre or more, for a school farm and garden. It is not essential that the topics be studied in the order given below or in the order given in any text-book. A seasonal arrangement is strongly recommended. The work in animal husbandry should include a careful study of the principal types and breeds of the more common farm animals. Emphasis should be placed upon the study of horses, cattle, swine and poultry. There should be practice in stock judging, with the use of the score cards.

No special list of experiments is required. Each teacher should secure from the standard laboratory manuals a list of at least sixty experiments. These experiments are to be in addition to any experiments or demonstrations given by the teacher. Practically every topic in the outline given below may be made the basis of a profitable laboratory or field exercise. The outline is as follows:

Farm and Garden Crops.—(1) Plant propagation: seeds; buds. (2) Cereal crops: corn; wheat; oats; rye; barley. (3) The legumes: the clovers; cowpeas; soy beans; alfalfa; veatch. (4) Grass crops: timothy; bluegrass; red top; orchard grass; millet. (5) Orchard crops: apples; peaches; pears; plums; cherries; nuts. (6) Small fruits: strawberries; grapes; blackberries; raspberries; currants; gooseberries. (7) Kitchen garden crops: potatoes; sweet potatoes; tomatoes; melons; cabbages; cucumbers; radishes; lettuce; beans; peas; onions. (8) Fibrous and miscellaneous crops: cotton; flax; hemp; broom corn; castor beans; sorghum. (9) The wood lot: timber crop. (10) Insect enemies of farm crops.

Soils.—(1) Origin and formation. (2) Composition and classification. (3) Soil water. (4) Soil air. (5) Soil temperature. (6) Soil drainage. (7) Soil organisms. (8) Meaning and method of testing the soil.

Animal Husbandry.—(1) The horse: origin and brief history; the two principal types, including the speed type and the draft type; breeds, including draft breeds (Percheron, Clydesdale and English Shire), roadsters (American trotter, American Saddle horse, English thoroughbred, Hackney, French coach); care of horses. (2) Cattle: origin and brief history; the two principal types (dairy cattle, beef cattle); breeds, including beef breeds (Shorthorn, Hereford, Polled Hereford, Aberdeen Angus, Polled Durham, Galloway), dairy cattle (Holstein, Friesian, Jersey, Guernsey, Ayrshire, Dutch Belted, Brown Swiss), dual purpose breeds (Shorthorn, Devon, Red Polled); cattle products, including meat, milk, leather, glue, etc. (3) Sheep: the two types, including wool-producing and mutton producing; principal breeds including wool-producing (American Merino, Delaine, Rambouillet), mutton producing (Shropshire, Southdown, Cotswold); care of sheep. (4) Swine: the principal breeds including Poland China, Berkshire, Duroc-Jersey, Chester White, Hampshire, Tamsworth, Large Yorkshire; care of swine; diseases of swine and how to control or prevent them, especially cholera and tuberculosis. (5) Poultry. (6) Chickens: the four principal types, including meat type, egg type, general purpose type, ornamental type; breeds, including meat type or Asiastic class (Brahma, Cochin, Langshan); egg types or Mediterranean class (Leghorns, Minorcas, Black Spanish); general purpose or American type (Plymouth Rock, Wyandotte, Rhode Island Red); care of poultry, including feeding chickens, the incubator, the chicken house; poultry and poultry products, importance, value and use.

Farm Management.—(1) Choice of farm. (2) Farm sanitation. (3) Farm buildings. (4) Farm machinery. (5) Maintenance of soil fertility. (6) Improvement of farm animals. (7) Farm records and accounts. (8) Feeds and feeding. (9) Miscellaneous problems.

Ornamental Gardening.—(1) Location of building and farm structures. (2) The lawn. (3) Roads, walks and drives. (4) Arrangement of trees, shrubs and flowers. (5) Planting and care.

For laboratory equipment, see pages 73-75.

For library equipment, text-books and laboratory manuals, see pages 128-129.

MUSIC

ONE UNIT MAY BE OFFERED

In the unit's work in Music, the pupils should acquire the ability to do the following:

1. To sing a selection (unaccompanied) in the key and time in which it is written, after having had the pitch "C" given to them. Either the "movable do" or "fixed do" methods may be used or better still the syllable "la" as disassociated from either. In the matter of difficulty, the selection should be on a par with songs found in books suitable for High School Choral practice, such as Hoff's *Corona Song Book,* Ripley and Tapper's *Advanced Music Reader* (The Natural Course), Smith's *Fourth Book* (The Modern Music Series), Tomlin's *Laurel Song Book.*

2. To name and qualify (perfect, major, minor, augmented, diminished) intervals struck on the piano, both in succession and combination, by other persons. The pupils should not see the keys as they are struck, but should recognize the intervals by ear. The tests as given under 1 and 2 are for the purpose of a clear recognition of tones and their symbols.

3. To write the chords to figured basses, implying a knowledge of the primary and secondary triads in major and minor and their inversions and of the chord of the dominant seventh with its inversions and resolutions. This work is covered in the first 77 pages of Jadassohn's *A Manual of Harmony.*

If the pupils have not had music in the grades, proficiency in sight reading may be acquired by the use of such books as *The Modern Music Series* (Primer, First Book, Second Book, Third Book), Silver, Burdett; *Educational Music Course* (First Reader, Second and Third Readers; Fourth and Fifth Readers), Ginn; and *Natural Music Course* (Primer, First Reader, Second Reader, Third Reader), American Book Co.

For continuing Music in the High Schools, such books as the following will be found serviceable: *The Laurel Song Book,* (Boston), C. C. Birchard; *The Corona Song Book,* Ginn; *Songs of the Nation,* Silver, Burdett; *Standard Songs and Choruses,* American Book Co.; *The Modern Music Series*—Fourth Book, Silver, Burdett; *Art Songs for High Schools,* American Book Co.

While sight-reading necessarily implies ear-training, special attention may be given to the latter subject by the use of such a book as Heacox's *Ear-Training,* (Philadelphia), Presser.

It is suggested that the work in harmony be based on such a book as Jadassohn's *A Manual of Harmony,* (New York), Schirmer.

DRAWING

TWO UNITS MAY BE OFFERED

The outline below, recently adopted by the North Central Association of Colleges and Secondary Schools, indicates the nature of the work which should be included in the two units of Drawing. While the work is not separated here into a *first* and *second year* program, the more elementary forms of each phase of the subject should be selected for the *first year*. Approximately one-third the time should be given to representative drawing and two-thirds to decorative composition, constructive and decorative design, construction and applied design.

The outline is as follows:

Pictorial.—Plant study (flowers, sprays of leaves, seeds, pods, etc.). Object study. Landscape (roof studies, buildings, etc.). Pose drawing. Composition.

Decorative Composition.—Plant forms, object study, landscape, pose.

Decorative Design.—Plant analysis (for the purpose of design). Conventionalized plant forms. Decorative units, borders, surfaces, corners, rosettes, posters, book-covers, etc. Stencils, wood-block printing. Historic ornament. Arrangement of straight lines, and of straight and curved lines. Geometric design. Lettering, illuminating. Schemes for interior decoration.

Constructive Design.—Designs for pottery, leather, metal, bookbinding, furniture, cardboard construction, textiles, etc.

Crafts.—Pottery, leather work, metal work, book-binding, furniture. (Choice of one or more of the above crafts.)

Applied Design.—Design applied to the crafts and to cardboard, textiles, etc.

Illustration.

Talks on history and industry of art, on civic planning, domestic architecture and decoration.

Instrumental drawing to be given as needed to meet the requirements of practical designing and construction.

Note.—Mediums used: pencil, charcoal, water colors, crayons, brush and India ink, and a combination of the pure mediums.

It is desirable to accentuate the life interest in these subjects as well as the technical achievement. Taught from the standpoint of their social interest, these topics may be made of great benefit in the adjustment of the student to social life. For example, in constructive design the problem of the house could be studied from the view-points of convenience, suitability, cost, appearance, etc. Under decorative design, schemes for the interior decoration of one or more rooms in the individual pupil's house (as planned above) could be worked out. This idea might be extended to embrace business houses, factories, etc. The pictorial composition could deal largely with the industrial occupations of man, with sketch and pose work made tributary to this end. Complete expression is to be sought; and, whenever possible, the problem should be approached from the side of its relation to the life of the student.

For library equipment, see pages 130-131.

MANUAL TRAINING

TWO UNITS MAY BE OFFERED

A Unit in Woodworking. In the outline, given below, of a one year course in woodworking, the work has been arranged in groups. Each group contains a number of problems involving the same process. The arrangement provides for the uneven progress of the class, and the teacher is able to keep all members of the class engaged on the same type of work, although working on different objects. A number of supplementary exercises should be provided. The student may be permitted to make almost any object which involves the processes or principles of the group in which the class is working. The subject-matter is indicated under the heading "Processes."

The outline is as follows:

Group I. Giving the first use of the saw and the laying-out tools, such as the gage, trysquare and rule.

Processes.—Measuring, squaring, gaging, sawing, boring, making dowel.

Problem.—Game board, counting board, laundry list, puzzle, etc.

Group II. Emphasizing the first use of the plane.

Processes.—Planing: surface, edge, to dimensions, chamfering.

Problem.—Swing-board, hat-rack, bread-cutting board, etc.

Group III. Teaching the first use of the chisel.

Processes.—Vertical chiseling, gouging, paring, sharpening chisel.

Problem.—Shelf and brush-rack, tray, sleeve-board, etc.

Group IV. Involving "form-work" and the first use of the spokeshave.

Processes.—Bow-sawing, modeling, sand-papering.

Problem.—Coat hanger, tool handle, canoe paddle, etc.

Group V. The construction of objects by means of some form of the groove joint.

Processes.—Housing, halving, nailing, carving, finishing.

Problem.—Waterwheel, test-tube rack, book-rack, flower-pot stand, loom, sled, box-trap, bracket-shelf, knife-polishing board, towel roller, etc.

Group VI. More exact work in planing in order to make a glue joint.

Processes.—Planing joints, gluing, clamping.

Problem.—Bread-moulding board, drawing board, bench-hook, etc.

Group VII. Construction by means of the mortise-and-tenon joint.

Processes.—Laying out duplicate pieces, cutting a mortise, sawing tenon, finishing.

Problem.—Stool, plant-stand, taboret, umbrella rack, table, etc.

Group VIII. Construction involving the mitre joint.

Processes.—Planing parallel edges and sides, use of mitre-box, laying out brace.

Problem.—Mitre-box, framing a picture, box, bracket, etc.

Group IX. Elementary cabinet making involving the use of panel.

Processes.—Plowing, fitting, putting on hinges.

Problem.—Sewing cabinet, music cabinet, plate-rack, screen, bookcase, etc.

In taking the course outlined, the student should learn the following:

With reference to *tools*.—(1) To use the rule in measuring and dividing spaces. (2) How and when to use knife and pencil in laying out work. (3) To use dividers or compasses to draw arcs or divide spaces. (4) To use try-square to lay out work and to test work. (5) To use, adjust and sharpen jack plane and block plane. (6) When and how to use crosscutting saw, rip saw and back saw, together with a knowledge of the distinguishing characteristics of these saws and the reasons for these differences. (7) To use and sharpen chisels. (8) To use hammer and nail set. (9) To use screw driver and countersink for setting screws. (10) To use brace and bit, and also how sizes of bits are designated. (11) How and when to use spoke-shave, file and sand-paper. (12) To use gouge. (13) To name all of the tools used.

With reference to *processes*.—(1) To make, mark and use a working corner. (2) To take proper steps in making a board a given length, width and thickness. (3) To detect direction of grain and use this knowledge. (4) To lay out and bore a hole through a board. How to bore to depth. (5) To plane a surface true. (6) To lay out and make a chamfered corner. (7) To lay out and make a rounded corner. (8) To make a "butt" joint. (9) To lay out and make properly a housed or dado joint. (10) To lay out and make properly a cross-lap joint. (11) To lay out and make properly a "mortise and tenon" joint. (12) To make a glue joint. (13) To lay out and make miter joint. (14) To construct a panel. (15) To apply simple finishes.

A Unit in Mechanical Drawing. The outline of a unit in Mechanical Drawing is given below. In all pencil drawing with instruments, great care should be taken to make sharp lines with accurate intersections. Do not delay precision till ink is used.

In the *first half year,* such as the following should be studied:

Straight lines.—Use of T-square, triangles, pencil, ruling pen, dividers, and scale; conventional lines; freehand working sketches.

Circles.—Use of compasses; center lines; cross hatching.

Tangents.—Location of centers and points of tangency.

Planes of projection.—Elementary principles of projection; projections of simple geometric figures.

Revolution of objects.—"Views" of objects in simple and inclined positions.

Developments.—Prism; cylinder; pyramid; cone.

In the *second half year,* such as the following should be studied:

Intersections.—Axes in the same plane; axes in different planes.

Isometric and cabinet drawing.

Freehand and mechanical lettering.—Placing; form; slant; spacing; stroke.

Working drawings.—Furniture.

Working drawings.—Machine parts.

For laboratory equipment, see pages 75-79.
For library equipment, see pages 131-132.

HOUSEHOLD ARTS (DOMESTIC SCIENCE AND ART)

TWO UNITS MAY BE OFFERED

One unit may be offered, composed of the most important portions of the two units given below, or each of the units mentioned below may be offered individually.

A Unit in Cooking. A unit in cooking should consist of (1) a study of the production, manufacture and composition of typical foods, their classification according to the food principles contained therein, and the study of the relation of these to the needs of the body; (2) a study of the fundamental scientific principles underlying the cookery processes and their application in the cooking of typical foods; (3) a study of the principles involved in the cleaning and caring for the various sorts of utensils and materials found in the kitchen.

Owing to the fact that the course in cooking has not yet been definitely standardized, a detailed outline, which represents the work done in some of the best high schools, is given. The teacher, in order to adapt it to local conditions, should judiciously make eliminations and additions, and should modify the order and emphasis.

The outline is as follows:

The Kitchen.

Recitation.—(1) Shape and size. (2) Equipment: desk and individual equipment; cupboard and group equipment; sinks and supply tables; refrigerator; burners and ranges. (3) Care of kitchen: reason for cleanliness; means of securing cleanliness; importance of order and system.

Laboratory work.—(1) List and care for articles in desk. (2) Clean and conveniently arrange cupboards. (3) Care of sinks and supply tables by different girls—housekeepers. (3) Clean refrigerator. (5) Wash dishes and towels. (6) Care for burners and ranges. (7) Read gas meter. (8) Calculate cost of gas per hour. (9) Probable cost in home.

Fuels and their Combustion.

Recitation.—(1) Kinds and classes. (2) Value of different fuels; calorific; economic; as to convenience. (3) Essentials of combustion. (4) Meaning of kindling point. (5) Products of combustion. (6) Causes and effect of incomplete combustion. (7) Need for extraordinary ventilation of kitchen. (8) Different kinds of gas, carefully studied. (9) Study matches.

Laboratory work.—(1) Note effect of closed and open mixer of burner; closed and open drafts of stoves. (2) Comparison of various methods of supplying oxygen for combustion. (3) Ventilate kitchen and class room. (4) Compare different types of burners.

Water.

Recitation.—(1) Kinds and composition. (2) Use as a cleaning agent; use as a medium in cooking; uses in the body. (3) Purification of water, including household methods. (4) Treatment of hard waters.

Laboratory work.—(1) Determine temperature of water when small bubbles begin to rise; when larger bubbles rise and break at the surface; when the whole surface is agitated. (2) Determine temperature of steam. (3) Determine temperature in double boiler. (4) Determine source of home and school water supply. (5) Soften water for cleaning. (6) Filter water through various mediums.

Fruits.

Recitation.—(1) Uses of various grades of fresh fruits. (2) Composition and value as food. (3) Processes of preparing fresh fruits. (4) Decay of fruit: cause and prevention of decay; means of destroying micro-organisms; resistance of spores. (5) Methods of preserving fruits and vegetables: sorting; cleaning; storing; drying; sterilizing; use of sugar, spices, vinegar; low temperature; cold storage; fraudulent and harmful preservatives. (6) Uses of preserved fruits. (7) Comparison of fresh and preserved fruits and vegetables as to cost; as to food value. (8) Food laws governing sale of fresh and preserved fruits and vegetables. (9) Reading and interpreting all food labels.

Laboratory work.—(1) Sort fruit for different purposes. (2) List fruits according to water content. (3) Cook fruits in various ways as boiling, baking, stewing, scalloping. (4) Observation of decay and mold of fruit. (5) Examination of bacteria and mold under microscope. (6) Determine conditions favoring and retarding growth of microorganisms. (7) Can fruit and vegetables by different methods. (8) Preserve and pickle. (9) Extra sterilization. (10) Make jellies, butters, jams, etc. (11) Cook dried fruits; compare weight of fruit before and after soaking. (12) Make list of groceries which protect fruits from street dirt.

Vegetables.

Recitation.—(1) Composition. (2) Classes: according to part of plant used; according to composition; according to flavor.

Laboratory work.—(1) Preparation of different classes of vegetables—tomatoes, cabbage, potatoes, carrots, turnips, onions. (2) Different methods as boiling, steaming, stewing, creaming, baking, scalloping, sautéing. (3) White sauce for different purposes. (4) Cream soups. (5) Examine section of potato to see starch cells. (6) List ways of preventing lumping of starchy materials. (7) Determine thickening power of different starchy materials. (8) Use iodine test on different starchy foods. (9) Dextrinize flour—make toast, croutons, etc.

Starch.

Recitation.—(1) Structure and composition. (2) Various theories as to starch cell. (3) Properties: effect of moist and dry heat; effect of acids; tests for starch. (4) Digestion and value as food. (5) Method of cooking as related to composition. (6) Value of vegetables in the diet.

Cereals.

Recitation.—(1) Composition. (2) Value as food. (3) Structure. (4) Manufacture. (5) Kinds: comparative value and cost. (6) Effect of different methods of cooking on flavor and digestion. (7) Predigested cereals.

Laboratory work.—(1) Cook different kinds of cereals by different methods, using fireless cooker, if possible. (2) List amounts of different cereals that ten cents will buy; fruit combinations.

Sugar.

Recitation.—(1) Source, kinds and composition. (2) Manufacture of sugars and syrups. (3) Properties: effect of heat; moisture; dryness; effect of acid. (4) Digestion and value as food; danger of excess. (5) Adulteration of confectionery. (6) Glucose.

Laboratory work.—(1) Make syrup test with thermometer. (2) Make peanut brittle, fondant, caramel. (3) Make syrup, frosting, marguerites. (4) Make fudge, creams. (5) Figure cost of home made and purchased candies. (6) Trip to candy factory or kitchen, if possible.

Milk.

Recitation.—(1) Composition. (2) Value as food: value of casein; importance of nitrogen; nutritive value for young and adult. (3) Effect of heat: effect of high temperature in making cottage cheese and junket; relation of temperature of cooking to digestion; effect of pasteurizing and sterilizing on nutritive value and flavor. (4) Effects of acid, rennet, bacteria. (5) Care of milk: importance of cleanliness and low temperature; milk as a carrier of infection; dangers of old milk. (6) Milk as found on the market: modified, certified, condensed, and slightly condensed, malted, pasteurized, etc. (7) Factors in cost of milk. (8) Milk products. Effect of cleanliness and temperature on flavor. (9) Food laws concerning milk and milk products; inspection of dairies and wagons.

Laboratory work.—(1) Separate milk into its parts. (2) Make: butter; cottage cheese; junket; cocoa. (3) Sour milk and its uses. (4) Skimmed milk, cost and use. (5) Compare scalded and boiled milk. (6) Visit a good dairy, if possible. (7) Investigate school and home milk supply.

Cheese.

Recitation.—(1) Composition. (2) Manufacture and kinds: value of bacteria and molds in producing flavor. (3) Digestion and value as food.

Laboratory work.—(1) Make a collection of various cheeses.

Eggs.

Recitation.—(1) Composition. (2) Value as food: importance of albumin. (3) Structure. (4) Preservation: cause of decay; methods of preserving; means of testing. (5) Effect of heat and methods of cooking. (6) Economy in use of eggs; cost in different seasons; substitutes for eggs; commercial abuses. (7) Combinations: milk, eggs, cheese.

Laboratory work.—(1) Preserve eggs for winter use. (2) Test eggs for freshness. (3) Determine effect of different temperatures on eggs. (4) Cook eggs in different ways: soft and hard cooked; poached; omelets. (5) Determine cost of egg dishes at different seasons. (6) Invalid dishes. (7) Make custards, rarebits, souffles, macaroni, rice and potatoes with cheese.

Meat.

Recitation.—(1) Structure. (2) Composition and nutritive value.

(3) Selection of meat: freshness, age and condition of animal; location and cost of cuts; suitability of cut to purpose. (4) Flavor of meat; importance of extractives; ripening of meat. (5) Effect of heat: on connective tissues and walls of tubes; on juices or contents of tubes. (6) Reasons for cooking. (7) Methods of cooking: tender and tough cuts; retention of juices by searing. (8) Extraction of juices by soaking, etc. (9) Breaking up of connective tissues by cutting or grinding. (10) Removal of connective tissue by scraping. (11) Softening connective tissues by long slow cooking in water. (12) Special methods of preparing and cooking veal, mutton, pork, poultry, fish and special organs. (13) Use of left-overs: suitable combinations of flavor; dangers of food poisoning from stale meat. (14) Preservation of meat and uses of preserved meats; cold storage, canning, use of preservatives; relation of preservatives used to method of cooking. (15) Cost of meat: of different cuts and animals; at different seasons; as compared with meat substitutes. (16) Food laws concerning fresh and preserved meats.

Laboratory work.—(1) Scrape tough and tender meat to determine structure and cause of toughness. (2) Experiment with meat to determine some of the constituents and their characteristics. (3) Examine cuts of meat used: as to location of bone; amount of fatty tissue; color and grain of muscle. (4) Make drawing of animal, showing location of cuts. (5) Visit meat market, if possible. (6) Preparation of tender cuts: broil; roast. (7) Preparation of tough cuts: make meat stock, various stock soups, beef juice, beef tea; make Hamburger or loaf; make scraped meat sandwiches or meat balls; make pot roast, stew or friccassee. (8) Prepare veal, mutton, pork, poultry and fish including oysters: different methods as sautéing, roasting, stewing, frying, creaming. (9) Make dressing for roast. (10) Make sauces for serving. (11) Use left over meat in various ways, as scallop, meat pies, hash, sandwiches, etc. (12) List vegetables and seasonings that go well with different meats. (13) Cook bacon, "boiled" ham, corned beef, etc. (14) List cuts of meat according to price. (15) List foods that might be substituted for meat in the diet. (16) Meat extracts.

Fish.

Recitation.—(1) Sources and kinds. (2) How judged. (3) Dangers of old fish. (4) Preserved fish.

Laboratory work.—(1) Cook fish in various ways. (2) Sauces: hollandaise, tartar, egg.

Gelatin.

Recitation.—(1) Source. (2) Commercial preparation. (3) Properties. (4) Composition. (5) Value as food: in carrying flavor; in furnishing nourishment; function in the body.

Laboratory work.—(1) Make gelatin from meat and bone. (2) Make gelatin preparations using commercial gelatin: plain gelatin, charlottes, etc. (3) Compare fruit gelatin with "ready to use" preparations.

Legumes and Nuts.

Recitation.—(1) Composition. (2) Value as food: use as meat substitutes; digestion of.

Laboratory work.—(1) Baked beans. (2) Dried pea or lentel soup. (3) Salted almonds and peanuts. (4) Collection of nuts in natural cases.

Fat.

Recitation.—(1) Composition. (2) Value as food: function in the body; digestion of fat and foods coated with fat. (3) Kinds, source, form. (4) Structure of fatty tissue. (5) Application of heat: danger of accidents in frying, from combustion of fat, from expansion of moisture; means of preventing fat soaking; scorching of fat. (6) Economy in using fat: cost of various kinds; butter substitutes for cooking; lard substitutes. (7) Food laws concerning various fats.

Laboratory work.—(1) Render fat. (2) Determine temperature for frying cooked and uncooked materials. (3) Fry cooked and uncooked foods: use different fats. (4) Clarify fat. (5) Use partially decomposed fat for soap making. (6) Recognition of oils: olive, domestic and foreign; cotton seed oil; use of lard substitutes.

Batter and Doughs.

Recitation.—(1) Flour: composition; kinds and classes, according to composition, according to process of manufacture, according to grains used; value of the different classes, as food, for bread making. (2) Leavening agents and their action: air and steam, effect of heat, importance of elasticity of white of egg and gluten; carbon-dioxide, action of soda with sour milk, molasses, cream of tartar; action of baking powder, different kinds, effect of heat and moisture; action of yeast, different kinds, conditions favorable and unfavorable to growth, products of fermentation.

Laboratory work.—(1) Determine main constituents of flour. (2) Determine properties of gluten and make gluten balls. (3) Visit flour mill, if possible. (4) Determine tests for different oven temperatures. (5) Make sponge cake and popovers. (6) Make cereal griddle cakes, muffins, cakes, biscuits, pastry, steam puddings. (7) Determine effect of combining soda with sour milk, soda with cream of tartar and baking powder with moisture. (8) Determine suitable temperature and food for yeast. (9) Compare flours and discuss varying results in gluten content. (10) Compare various national breads.

Bread.

Recitation.—(1) Methods of making: materials used. (2) Relation to kind and condition of yeast. (3) Amount and kind of flour. (4) Reasons for kneading. (5) Relation of temperature and amount of yeast to time. (6) Baking: time and temperature; changes produced. (7) Care of bread after baked. (8) Souring and other undesirable changes in bread. (9) Comparison of home made and baker's bread: need of standard; digestion of yeast breads, quick breads and toasts, nutritive value and cost of bread.

Laboratory work.—(1) Bread making: short and long process; plain, whole wheat, graham, rye; plain and fancy rolls; bread with nuts or raisins. (2) Judge bread. (3) Visit bakery, if possible. (4) Determine cost of bread made. (5) Make toast, croutons, sandwiches, etc. (6) Macaroni and similar products. (7) Noodles.

Salads.

Recitation.—(1) Value in diet: as nourishment; as an appetizer; for furnishing variety; for the mineral of fresh fruits and vegetables; economic value. (2) Preparation: importance of freshness and crispness; importance of thorough washing of uncooked foods; importance of attractiveness in arrangement of color, form and texture, size of service, garnish; suitable combinations; considering flavor; food nutrients; digestion.

Laboratory work.—(1) Select materials for salads. (2) Prepare materials for salads: salad plants; other materials, as spring fruits and vegetables, winter fruits and vegetables, meats, nuts, eggs and cheese, left-overs; cooked French and Mayonnaise salad dressings. (3) Attractively arrange materials. (4) Determine cost of salads made. (5) An exhibition of salads.

Frozen Dishes.

Recitation.—(1) Value of frozen dishes. (2) Freezing: cause of freezing; construction of freezer; uses of fireless cooker.

Laboratory work.—(1) Care of freezer. (2) Make water ices, sherbets, ice cream and mousse. (3) Determine temperature of freezing mixture and frozen material. (4) Determine cost of desserts made. (5) Improvise freezer for individual use.

Beverages.

Recitation.—(1) Tea, coffee, cocoa, chocolate: important constituents; methods of preparation; buying, and care in the home; substitutes; physiological effects. (2) Fruit drinks: value of the diet, in sickness and health; kinds; national habits. (3) Special preparation for the sick: discussion of varying conditions and consequent needs; other methods of feeding.

Laboratory work.—(1) Make tea and coffee; compare steeped and boiled tea and coffee. (2) Make cocoa and chocolate. (3) Make fruit drinks. (4) Make preparation used in liquid and semi-liquid diet. (5) Prepare invalid's tray. (6) Broths: stimulating preparations like beef juice, meat extracts, etc.; gluten breads; liquid egg foods; plain diets; uses of milk.

Summary.

Recitation.—(1) Definition of food. (2) Classification of food according to food principles. (3) Temperature suitable for each class. (4) Digestion and assimilation of each class. (5) Value of food and food requirements: function of each class; comparative value of different foods; food value represented by calories; food requirement represented by blocks, figures or charts; food requirements for people of different ages and occupations; national and foreign investigations; dietary standards of various investigators. (6) Importance of purity of food. (7) Cost of food: comparative cost of different classes of food; cost of food at different seasons; relation of cost of food to total cost of living and to income.

Laboratory work.—(1) Review note books. (2) Make classification of foods studied: list foods according to their protein fat and carbohydrate content; list foods rich in the different kinds of mineral matter. (3) Weigh portions of food that are equivalent in total nutrients, total protein, or that yield 100 calories, or that represent a Chittenden or Atwater meal. (4) Compare cost of different cooking lessons during the year.

A Unit in Sewing. A unit in sewing should consist of (1) a study of the production and manufacture of the textile fabrics (cotton, wool, flax, silk), and methods of detecting the more usual forms of adulterations; (2) laboratory work in sewing, which should include hand-work and machine stitches as applied to household articles and clothing, the drafting of patterns for under garments and waists, and the use of commercial patterns; (3) consideration of such problems as fitness of garment to purpose, color harmonies in dress, cost of the home-made garment versus the factory-made garment, etc.

As in the case of cooking, the course in sewing has not as yet been definitely standardized, and therefore a detailed outline, which represents the work done in some of the best high schools, is given. The teacher, in order to adapt it to local conditions, should judiciously make eliminations, and should modify the order and emphasis.

The outline is as follows:

Equipment for Sewing.

Recitation.—(1) Equipment needed for hand sewing. (2) The work box and its contents. (3) Construction and care of sewing machine. (4) Suitable chairs and tables. (5) Lighting of the room.

Laboratory work.—(1) Select and list price of individual sewing equipment. (2) Clean, oil, understand and use machine and attachments.

Use or Purpose of Clothing.

Recitation.—(1) Fulfillment of purpose: under and outer garments. (2) Suitability of clothing for various occasions, such as business, home, sick room. (3) Clothing in relation to health: effect of too little and too much clothing; effect of pressure; loosely and closely woven fabrics; non-porous clothing.

Laboratory work.—(1) Collect references to and pictures of clothing of primitive and modern times. (2) Possible trip to store to see fabrics and garments. (3) Criticize own clothing on basis of purpose. (4) Plan clothing for various seasons and occasions.

Materials Used.

Recitation.—(1) Cotton, wool, flax, silk: structure and composition; effect of heat, acids, alkalies, moisture, light; conductive and absorptive properties of the different fibers; suitability of each for under and outer clothing; manufacture of the fibers into clothing; bleaching, dyeing, printing, mercerizing. (2) Use of uncommon fibers such as jute, ramie, pineapples, cocoanut, vegetable silk. (3) Leather, fur and rubber as materials for clothing.

Laboratory work.—(1) Collect samples of raw materials. (2) Examine fibers. (3) Test samples to determine quality; fiber or fibers present, closeness of weave, adulterants. (4) Determine characteristics of warp and woof of cloth. (5) Make textile collections, illustrating the variety, quality, price, possible use and enduring probabilities, under test of elements, chemicals, and laundering of finished products of different fibers.

Selection of Materials for Class Use for Articles or Garments.

Recitation.—(1) Purpose, cost, durability. (2) Width, amount, allowing for shrinkage. (3) Color, design, weave and finish. (4) Genuineness, quality. (5) For trimming. comparative value of hand and machine work; desirable qualities for trimmings, including good edge and simple design; kinds of embroidery, laces, drawn work, etc.; harmony of material and trimming in quality and color; inappropriateness of color in trimming undergarments.

Laboratory work.—(1) Examine samples and discuss suitability. (2) Combine samples of textile fabrics to show suitable color, quality and finish for suits for different occasions and individnals. (3) Buy materials for articles to be made. (4) Select trimmings, thread, etc. (5) List cost of materials. (6) Study design in embroidery, laces and other ornamentation.

Selection of Design for Making.

Recitation.—(1) Purpose of article. (2) Form and size of individual. (3) Personality and occupation of individual. (4) Artistic effect: good lines; good color combinations; effect of light on materials of various color, quality, finish. (5) Time and money to expend on making and laundering. (6) Examine ready-made garments in forms, workmanship, material, cost. (7) In cost of production, ascertain expense, profit in labor, in equipment, in capital. (8) Determining cost to class of materials; time consumed. (9) Compare result with shop article of same cost; and cost with shop article of same quality. (10) Summarize data and comment thereon.

Laboratory work.—(1) Make design for garments. (2) Take measures. (3) Draft patterns. (4) Compare and use drafted and bought patterns. (5) Criticize designs for clothing in magazines and papers. (6) Small articles of attire, conveniences for travel, for desk, room or house; the dressing of a doll for some needy child; the making of a garment for a child in need. (These ought to be made by a group of students together, the work should be dainty and parts regarded in relation to the whole. Beauty of effect should be ensured through simplicity in design and excellence of workmanship, even with crude or commonplace materials.) (7) Process in work: pattern placed together, examined in comparison with one blocked earlier; material examined for warp, woof, lengthwise, crosswise, bias, selvage; implications, comfort in wearing, hanging well and retaining shape and laundering; discuss and illustrate types of seams and finishings, select in accordance with purpose; cut, baste, sew, finish, examine; state in writing judgment of work and disclosed needs of worker.

Cutting.

Recitation.—(1) Economy. (2) Matching pattern in cloth. (3) Arrangement of pattern with weave.

Laboratory work.—Cut out garments.

Making.

Recitation.—(1) Characteristics of good workmanship in the making of garments or articles.

Laboratory work.—(1) Keep materials and hands clean while sewing. (2) Baste, fit, stitch and finish undergarments as drawers, underwaist and skirt or gown. (3) Make suitable seams, bands, bindings, facings, corners. (4) Make tucks and put on trimmings. (5) Make shirt waist and wash dress. (6) Possibly make wool skirt.

For laboratory equipment, see pages 79-81.

For library equipment, see pages 132-136.

ECONOMICS

ONE-HALF UNIT MAY BE OFFERED

The course in Economics should not be given earlier than the fourth year in the high school. The subject-matter should include the leading facts and principles of economics, such as division of labor, the factors of production, the laws of diminishing returns, demand and supply, value and price, wages, interest, rent and profit, credit, taxation, regulation of monopolies, and international trade. One of the better grade of texts in current use such as those by Bullock, Clark, Davenport, Ely and Wicker, Johnson, Laughlin, Walker, etc., will serve as a basis for the work, but should be supplemented with discussion and practical exercises. Written exercises are desirable.

For library equipment, see page 136.

COMMERCIAL GEOGRAPHY

ONE-HALF UNIT MAY BE OFFERED

The object of this course is to discover the causes of the present territorial distribution of industries and of the location of lines of communication and transportation. It should treat in detail with reference to the United States, and in less detail with reference to the outlying possessions of the United States and to the most important commercial countries, the following topics: (1) the effect of surface, soil, climate, etc., that is, the physical factor in commerce; (2) the influence of race, religion, education, commercial policies, etc., that is, the human factor in commerce; (3) the effect of economic forces on production and commerce; (4) means of transportation and communication. The text-book should be supplemented by map work and assigned readings. The census of manufactures in the United States and other countries would form a valuable reference library, both for the purpose of map work and assigned readings.

It is desirable that for purposes of illustration, samples of commercial staples, lantern slides, stereopticon pictures, etc., should be freely employed; and wherever possible, that visits of inspection be made and informal lectures secured by experts in various industries. Commercial Geography should be preceded by Physical Geography, in case both are given.

For library equipment, see page 136.

BOOKKEEPING

ONE UNIT MAY BE OFFERED

The work of *one unit* in bookkeeping is the equivalent of that normally done in five eighty-minute periods a week for the school year. The student should become familiar with the meaning of double entry terms, with rules for debit and credit, and the kinds and uses of books required in accounting. He should acquire the ability to keep a single entry and a double entry set of books. Furthermore, he should become familiar with such standard business forms as bills, receipts, checks, notes, time and sight drafts, endorsements, invoices, accounts sales, deposit tickets, express receipts, bills of lading, statements of account, balance sheets, etc. He should become familiar also with the forms of business letters, beginnings and endings, etc., and should know how to write and answer telegrams and advertisements.

Bookkeeping should be done largely under the eye of the teacher as laboratory work. Good penmanship, neatness in work, accuracy and speed must all be acquired in such laboratory practice. The exercises in some of the texts which are offered by the various publishers on first lessons or elementary principles would naturally form the basis for much of such work, unless the teacher prepares his own exercise work according to a similar plan. The best evidence of good work in this subject is the character of exercise work which the student can present as a result of his laboratory practice.

A *half-unit* in bookkeeping may be offered, the work to consist of that normally done in the equivalent of five eighty-minute periods a week for one-half of the school year.

Some of the best reference works, useful especially to the teacher in charge of elementary work, are Sprague's *Philosophy of Accounts,* Hatfield's *Modern Accounting,* Lisle's *Accounting in Theory and Practice,* Dicksee's *Bookkeeping for Accounting Students,* and Cole's *Accounts—Their Construction and Interpretation.*

TEACHER-TRAINING COURSES

TWO UNITS MAY BE OFFERED

For description of the teacher-training courses, see syllabus issued by State Superintendent of Public Schools, Jefferson City, Missouri.

II

SUGGESTIONS FOR THE EQUIPMENT OF LABORATORIES

GENERAL INFORMATION

The laboratories of a high school should be on the north side of the building, and the length of the room from east to west should be made much greater than the breadth from north to south. It is an object to have as much north light as possible. This is especially true of biological work. It is, however, not so necessary for Physics and Chemistry. In the work in Physics, sunlight may often be used to advantage and it is well to have one or two windows exposed to the sun. All laboratory rooms should be supplied with gas and water.

In the construction of a new building that is to contain a laboratory, it is important to remember that the windows should be high, running up to the ceiling; that the rooms should not be so deep from the windows on the north to the opposite wall on the south as to render it difficult for light to get readily across, and that the distance from the top of the window sills to the floor should be the same as the height of the laboratory tables. In horizontal measurement, the windows and intervening spaces of brick or stone should be about equal in width. Therefore, in horizontal measurement the north front of a laboratory should be nearly half glass. Too great care cannot be exercised to secure perfect ventilation. The temperature should be kept uniform.

The class room for the recitations in either Physics or Chemistry should be near the laboratory so that apparatus may be readily transferred to and fro. This room should have a demonstration table at least eight feet long, with both water and gas connections. If electrical power is available, this room should be wired for a lantern. Even if no lantern is available, the room should be curtained with opaque enameled cloth shades so that it can be darkened. In Missouri climate there are enough clear days to warrant special attempts to use sunlight in the class room work in Physics. One of the best arrangements is to place the demonstration table with its end toward a south window. Sunlight can then be thrown the length of the table by a mirror (heliostat) placed in the window.

But good rooms and equipment amount to little without good teachers, and the best teachers cannot do good work if opportunity be denied. Every high school in the State should have at least one person who does nothing but instruct by the laboratory method, and the larger schools should have two or more such teachers.

It is not possible for one person to meet as many classes a day in the laboratory as in the recitation room. If the quota of work for each teacher is six recitations a day, the teacher of science should not be expected to have more than four. Careful preparation for each laboratory exercise is indispensable. In the recitation work in Physics, it is essential that carefully planned demonstration experiments be given. These will require considerable time in preparation, but it is time well spent. Few things in a class room are more pleasing and more instructive than a well executed successful experiment, and few things are more disastrous than the failure of a demonstration.

It is not economy to buy too cheap apparatus. It is always best before purchasing to submit lists to the various apparatus companies for bids.

PHYSICS

As indicated in the definition of the unit, no special list of experiments is required, each teacher being given considerable latitude in the choice of experiments. Each school should offer about fifty experiments, not attempting to make all the pupils perform the same experiments. Experiments for any particular pupil should be to some extent chosen to meet the individual needs of that pupil. In counting the required thirty experiments, the "preliminary" experiments that appear in some lists must not be included, such experiments as measurements of lengths in centimeters and inches, measurements of areas and experiments designed solely to acquaint the pupil with the fundamental units and their measurement. Each experiment should be planned to illustrate some fundamental principle of Physics and this principle should be clearly brought out.

In equipping the laboratory, it is first necessary for the teacher to choose the laboratory manual and the list of experiments to be offered. When that is done, apparatus to fit that manual and that list can be selected. Apparatus purchased from a list prepared in any other way, will be unsatisfactory, and, in all probability, will not fit the work. The experiments as given in laboratory manuals are usually planned so as to obtain the maximum use of each piece of apparatus, thus reducing the number of pieces necessary to buy. To obtain benefit of this, the apparatus must be selected to fit this plan. If several different experiments are conducted at the same time, not only is the work of the individual pupil more independent, but needless duplication of apparatus is avoided. Thus a greater variety and better grade of apparatus is rendered available.

It is impracticable to make partial lists that are satisfactory. If only a small amount of money is available for apparatus it is best to buy an equipment covering definite portions of the subject as, for example, mechanics, heat and sound, which is fairly complete as far as it goes. Future additions are not only more likely to be obtained but can be selected more wisely. Under the instruction of the teacher, some of the necessary apparatus can be made at home. Many things can be picked up here and there that are very useful in the laboratory. For example, small scraps of different metals are useful for density or specific heat determinations. Often scrap iron that costs but little can be used in place of the more expensive large iron weights.

The following list is appended merely to give an idea of the cost of apparatus. *This list must be changed to suit the manual and the experiments given in the course.*

FOR TWELVE STUDENTS WORKING AT THE SAME TIME

MECHANICS AND PROPERTIES OF MATTER

6 30 cm. rulers with protractor on back	$ .18
6 meter rods, with brass tips	1.80
½ lb annealed iron wire, No. 24, on spool	.28
¼ lb spring brass wire, No. 27, on spool	.30
¼ lb spring brass wire, No. 24, on spool	.25
½ lb bare copper wire, No. 32, B. & S. gauge	.35
4 8 oz. spring balances, graduated in both English and metric units with flat backs, broad pointers	3.24
4 64 oz. spring balances, graduated in both English and metric units with flat back, broad pointers	2.00
6 white pine rods, straight grained, 41x½x½″	.30
6 white pine rods, straight grained, 41x1x½″	.36
2 sets iron weights, universal 1000 grams to 10 grams	3.60
4 mounted uprights 10 cm. scales, divided in mm	.64
12 hardwood prisms	.48
1 each steel bicycle balls, ¼″ & ⅜″ dia	.08
6 pulleys, wooden, cone bearing	2.40
3 sets rods for same	.19
1 steel rule, 20 cm. long, graduated in mm. & in	.90
1 Jolly balance, all metal	4.50
1 torsion apparatus after model of Carmen, complete with rods	12.00
1 micrometer-caliper, metric, 13 mm., friction head	3.00
1 vernier caliper, English and metric, inside and outside jaws, depth gauge	2.25
1 spherometer reading to 1—100 mm	3.00
1 "Cenco" triple beam balance complete (if a good beam balance is not available)	12.60
1 metal cylinder, iron, about 50 mm. long, 12 mm. diam., for density determinations	.15
1 metal cylinder, brass, about 50 mm. long, 12 mm. diam., for density determinations	.15

1 metal cylinder, aluminum, about 50 mm. long, 12 mm. diam., for density determinations	$ .15
2 smooth pine boards, 50x15x2 cm., for friction	.22
2 7″ hand screw clamps, No. 14	.72
3 waterproof cherry blocks, 3x3x1½″	.30
2 platform balances, Harvard trip agate bearing	12.00
2 sets weights, 1000 to 5 grams	2.15
2 sets weights, 5 to 0.01 grams	.40
5 waterproof loaded rectangular blocks	.90
1 lb sulphur rolls	.10
6 lead sinkers	.70
5 round waterproof rods, 8x½″	.25
4 Sp. Gr. bottles, 50 cc. approximately	1.45
4 glass "J" shaped tubes, closed at one end for Boyle's law	2.40
2 "Y" tubes of lead	.36
6 lb mercury and bot.	5.25
12 small glass tumblers	.48
12 glass tubes, 50 cm. long, 5 mm. diam	.40
6 screw pinchcocks	1.08
6 ft. rubber tubing, ¼″ diam.	.54
2 bottles, 2 liters capacity with stoppers, rubber, 1-hole	.60
1 condensing and exhausting pump (if better is not available)	3.25
2 lb paraffine	.30
1 barometer tube, 80 cm. long, 5 mm. bore, closed at one end	.25
1 Nicholson's hydrometer	1.20
1 jar for hydrometer, 12x2	.34
2 boards for composition of forces, 58x84 cm. with ring, and pegs	3.00
2 cars for inclined plane	1.80
2 pulleys for same	.60
4 iron balls, 25 mm. diam., for pendulum, ground and polished	.32
1 Pr. ivory balls, 50 grams and 150 grams	4.00
Total for mechanics and properties of matter	$100.51

HEAT

6 flasks, 125 cc., flat bottom	$ .32
3 air thermometer tubes, 2″ bulb	.46
12 thermometers—10 to 110 c, stem scale Jena glass	9.60
2 linear expansion apparatus, all metal with N. P. brass tube, lever reading	4.80
5 lb shot, No. 6	.70
8 calorimeters, polished, N. P.	2.88
4 Harvard apparatus "A" new style, with detachable tripod	8.00
1 lb heavy walled glass tubing, 1 to 2 mm. internal diam.	.60

3	iron supports, 2 rings each	$ .80
3	sheets brass wire gauze, 4x4″	.21
100	grams pure paraffine for melting point determination	.10
2	nests beakers, No. 1 to 3	.80
4	Florence flasks, 12 oz.	.50
4	Florence flasks, 16 oz.	.65
4	Florence flasks, 8 oz.	.47
	Total for heat	$ 30.89

SOUND

1	Kundt's apparatus with brass and steel rod, improved form	$ 3.30
1	sonometer with pulley for weights, 2 strings	4.50
2	annealed glass resonance tubes, open at both ends about 2.5 cm. diam., 120 cm. long, with sliding rod and piston support	3.60
1	tuning fork, C 128, 10″ long	1.80
2	tuning forks, C 256, 7¼″ long	2.00
2	tuning forks, A 426, 6¼″ long	1.26
2	tuning forks, C 512, 5⅞″ long	1.26
	Total for sound	$ 17.72

LIGHT

1	box to illustrate formation of images	$ .63
12	plane mirrors, 4x15 cm. or 2x6″	.84
10	double convex lenses, 10 cm. focus	1.00
10	double convex lenses, 15 cm. focus	1.00
6	lens supports	.60
6	screen supports	.42
6	pin supports	.42
6	Walter Smith school squares, med.	.36
1	double convex lens, 3.5 cm. diam., 15 cm. focus	.10
3	concave mirrors, brass, N. P.	.60
3	triangular glass prisms, 4″ long	.54
2	pieces heavy plate glass for refraction	.36
4	lb. paraffine candles, twelves	.64
	Total for light	$ 7.51

MAGNETISM AND ELECTRICITY

1	lb fine iron filings	$ .15
24	steel knitting needles	.20
10	bar magnets, 6″	1.50
4	compasses, 40 mm. diam., needle, 3 cm. long	.88

3	Sq. ft. heavy zinc sheet, 1-16″ thick	$ 1.23
1	galvanoscope frame	1.12
12	lead strips, 1x10 cm., with wire	1.20
4	Sq. ft. sheet copper, No. 24	2.70
10	glass battery jars, 4x5″	1.50
6	porous cups, 5x10 cm	.80
4	commutators	2.40
12	double connectors, brass	.96
¼	lb. copper wire, No. 30 D. C. C	.43
1	lb. copper wire, No. 20, D. C. C	.58
¼	lb. German silver wire, No. 30, D. C. C	.83
¼	lb. German silver wire, No. 24, D. C. C	.58
9	lb. commercial sulphuric acid and GSB	.70
1	slide wire Wheatstone bridge	2.70
1	set of 8 resistance spools after Hall	2.70
6	gravity cells, 6x8 complete	4.80
10	lb. copper sulphate	1.00
2	resistance boxes, 0.1 to 40 ohms, guaranteed accurate to ½ of 1 per cent, wound with manganin wire	13.50
1	tangent galvanometer	4.75
2	D'Arsonval galvanometers sensitive to 18 megohms with open coil, sight and scale attachment and leveling screws	10.00
10	empty spools for making resistance coils	1.00
	Total for magnetism and electricity	$ 58.21
	Total for entire Physics equipment	214.84

DEALERS IN PHYSICAL APPARATUS

Central Scientific Co., 345 West Michigan St., Chicago; Chicago Apparatus Co., 40-42 West Quincy St., Chicago; Wm. Gaertner & Co., 5347-9 Lake Ave., Chicago; T. W. Gleeson, 106 Sudbury St., Boston; A. W. Hall Scientific Co., 141 Franklin St., Boston; L. E. Knott & Co., 15-17 Harcourt St., Boston; C. H. Stoelting Co., 18 South Green St., Chicago. On demand, some of these firms furnish lists of apparatus to fit particular manuals. Many suggestions are also obtained by consulting their general catalogues.

CHEMISTRY

FOR TWENTY-FOUR PUPILS, TWELVE WORKING AT ONE TIME

FIXTURES AND PERMANENT EQUIPMENT

The first cost of the laboratory equipment will depend largely upon the quality of the tables for the pupils and the amount of plumbing

Two tables should be provided, each 12 feet long, with closet room for twelve students, and working space for six at one time. A very serviceable table with a moderate amount of plumbing can be built with a lead lined trough about 4 inches wide along the central length, and sink at one end. At the lower end, the trough should be about 6 inches deep, and heavy lead weighing 4 pounds per square foot should be used. The breadth of each of these tables should be at least 4 feet, preferably 4 feet and 4 inches; the height, 36 inches. If the tables are constructed as cheaply as possible, the cost complete with plumbing and sinks will be approximately $10 per lineal foot; i. e., about $120 per table. A table without plumbing will cost at least $6 per lineal foot. When first class material and workmanship are demanded, including sinks of alberene stone, the cost will be about $16 per lineal foot. Hence $150 to $400 should be allowed for tables.

Very suggestive details for laboratory equipment are given by Professor E. P. Schoch in Bulletin No. 210, University of Texas, entitled *Chemistry in High Schools.*

In addition to tables, the following items should be included in fixtures and permanent equipment:

1	draft hood	$25.00 to $75.00
1	wall shelf for reagents, liquids and solids	$5.00 to $10.00
15	one-liter stock bottles with glass stoppers	3.75
40	250 cc. (8 ounce) glass stoppered bottles, ("German tinctures") for liquids used as side reagents	6.00
60	250 cc. (8 ounce) wide mouthed flint glass bottles for solids as side reagents	12.00
6	earthen ware slop jars	1.50
1	automatic water still	25.00
1	stock and apparatus case, if storage closet or room for apparatus is not at hand	50.00
3	Kipp apparatus, 1 liter	6.00
1	Harvard trip scale, No. 332, Eimer and Amend's Catalog C, 1913	6.00
1	set of weights, 1000 grams to 5 grams	2.50
1	balance for quantitative work, E. & A's Cat. No. 300	12.50
1	set of weights, E. & A's Cat. No. 506, 1 gram to 200 grams	2.00
1	siphon barometer	8.00
1	blast lamp	2.00
1	bellows, foot, Fletcher's, 7 inch	4.50
1	Hoffman electrolysis apparatus, E. & A. 4244	4.50
1	frame for metric system	2.00

(A chart called the International Metric System can be obtained from the Bureau of Standards, Washington, free of charge. It is worth framing.)

1 induction coil for automobile use	$ 4.50
1 chart, periodic classification of the elements	1.25
2 burettes, Mohr's, for pinch cock, 50 c. c	1.25
2 burettes, Geissler's with glass cock, 50 c. c	1.85
1 burette clamp, Lincoln's	.50
3 sets of cork borers, 3 in set	.90
1 magnet	.20
2 magnifying glasses	1.50
1 ozone tube, E. & A. 4916	2.00
Total for fixtures and general equipment	$340 to $645

If the class work is to include demonstrations by the teacher, a small lecture table and special apparatus should be provided and the sum of $50 to $100 added for this.

APPARATUS MORE OR LESS PERMANENT*

30 nests of beakers, 2½, 4, and 7 ounces, plain Bohemian
30 blowpipes, jeweler's, 8 inch
6 dozen flint glass, wide mouthed bottles, 4 ounce
18 flint glass, wide mouthed bottles, 16 ounce
24 Bunsen burners with air regulator
8 dozen corks, 7-8 inch
4 dozen corks, 1 1-16 inch
12 dozen corks, assorted
18 nests of Hessian crucibles, "threes"
4 dozen 1 1-4 inch porcelain crucibles
24 50 cc. graduated cylinders
3 dozen German porcelain evaporating dishes, each 2½ and 3½ inch diameter
12 lead dishes, 2 inch
24 round files, 3 inch
24 three-cornered files, 3 inch
24 packages of filter paper, 4 inch
30 flasks, best Bohemian, 4 ounce
30 flasks, best Bohemian, 8 ounce
30 flasks, best Bohemian, 16 ounce
3 dozen German glass funnels, 2½ inch
24 pairs steel forceps, 5 inch
24 gas bottles, 8 ounce
50 rubber stoppers, two holes, to fit gas bottles
5 pounds glass tubing, 1-8 and 3-16 inch bore

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*These items are not priced as there is considerable variation in prices. A dealer in laboratory supplies will submit an estimate.

2 pounds glass rods, 1-8 inch diameter
2 quires test paper, litmus and turmeric
24 mortars, 2½ inch
4 feet platinum wire
30 2 ounce retorts with stoppers, best Bohemian
48 feet ¼ inch bore rubber tubing
48 feet 3-16 inch bore rubber tubing
30 tin sand baths, 5 inch
4 hand scales, 6 inch beam
4 sets weights, 0.1 gram to 50 grams
24 test tube racks
36 dozen test tubes, 6 inches by 5-8 inch
24 test tube brushes
3 dozen watch glasses, 2 inch
24 squares blue glass
48 hard glass test tubes, 6 inch
6 lamp tips
24 filtering stands, 1 arm, 2 holes
2 dozen iron wire triangles
24 pneumatic troughs, made by fitting half gallon or gallon crock with metal shelf
30 retort stands
1 package filter paper, 10 inch

Total cost, without freight ....$200 to $250

CHEMICALS

As the chemicals required will vary somewhat with different textbooks, the list recommended by the text selected should be provided. A very complete list with prices as given in Dr. Schoch's bulletin, referred to above.

SUMMARY OF EQUIPMENT

Fixtures and permanent equipment	$650.00 to $300.00
Apparatus more or less permanent	200.00
Chemicals	80.00
Total, at least	$580.00

MAINTENANCE

The yearly cost of "apparatus more or less permanent," which must be replaced on account of breakage, will be approximately	$60.00
The yearly cost of chemicals, approximately	40.00
Total annual expenditure	$100.00

DEALERS IN CHEMICAL APPARATUS

Apparatus and supplies may be obtained from the following firms: Eimer and Amend, 205-211 Third Ave., New York City; Wm. Gaertner and Co., 5345-5349 Lake Ave., Chicago; E. H. Sargent and Co.; 143-145 Lake Street, Chicago; Henry Heil Chemical Co., 212-214 South Fourth Street, St. Louis; Scientific Materials Co., Pittsburgh, Pa.; Central Scientific Co., 345 West Michigan Street, Chicago; Kewaunee Manufacturing Co., Kewaunee, Wis. (laboratory furniture), Leonard Peterson & Co., 1240-1248 Fullerton Ave., Chicago (laboratory furniture); L. E. Knott Apparatus Co., Boston, Mass.; Bausch and Lomb Optical Co., Rochester, N. Y.; Woldenberg and Schaar, 387 Wabash Ave., Chicago; C. H. Stoelting Co., 121 North Green Street, Chicago; Max Kohl, Chemnitz, Germany; Drs. Peters and Rost, Chaussee Strasse, Berlin, Germany.

GENERAL BIOLOGY, BOTANY AND ZOOLOGY

FOR TWELVE PUPILS WORKING AT THE SAME TIME

APPARATUS

6 compound microscopes, from $20 to $30 apiece	$120.00 to $180.00
2 laboratory tables, with drawers, 96 inches long, 36 inches wide, 29 inches high, heavy white pine, oiled top	20.00
12 pairs scissors, fine	6.00
12 scalpels	3.00
12 pairs forceps, medium fine, straight points	4.80
24 dissecting needles	1.00
6 section razors	6.00
12 dissecting lenses, one inch focus (or reading glasses 2½ inches in diameter)	12.00
1 balance, with weights	4.25
2 gross glass slides, 3x1 inches	2.00
4 ounces cover glasses, ¾ inch square	3.20
24 Syracuse watch glasses	1.25
24 pipettes, with rubber bulbs	.75
2 pounds glass tubing, assorted sizes	1.50
1 lot large flat dishes, glass or porcelain	....
24 Mason fruit jars, quart	2.00
24 test tubes	.38
1 lot guarded bristles	....
1 galvanized iron waste can, with cover	1.25
1 lot battery jars, large	....

REAGENTS AND CHEMICALS

10 pounds formalin	2.50
1 gallon alcohol, 95 per cent	4.00

1 quart absolute alcohol	$ 1.90
1 pound ether	.85
1 pound mercury	1.50
2 gallons distilled water	....
1 pound glycerine	.50
1 pound turpentine	.15
½ pound cedar oil	.75
3 ounces balsam, in xylol	.60
1 pound glacial acetic acid	.50
1 pound sulphuric acid	.30
1 pound hydrochloric acid	.15
1 pound nitric acid	.50
½ pound picric acid, crystals	.75
½ pound corrosive sublimate	.60
1 pound chloroform	.75
1 pound caustic potash	.40
½ pound potassium cyanide, fused lumps	.45
1 ounce iodine, resubl	.60
½ ounce methyl green	.40
6 ounces haemalum, solution	.60
3 ounces acid carmine, solution	.70
½ ounce eosin, powder	.45
1 ounce pith, for sectioning	.10

All of the above are list-prices, except those for compound microscopes, which are special prices for schools.

Although all of the articles given in the above lists are recommended, nevertheless good work can be done with a smaller equipment. In the average school much will depend upon the teacher's ingenuity in devising substitutes for apparatus at little or no expense. Aquaria for keeping aquatic forms alive in the laboratory are necessary and for this purpose large battery jars will be found satisfactory. One dozen tumblers, some wide mouthed bottles with corks for water or sand cultures, a few thistle tubes, some rubber stoppers, rubber tubing, beeswax or paraffine, and some bibulous paper will be found helpful additions for any work in plant physiology. A few stoneware saucers will also be found indispensable for work on the germination of seeds. Insect cages may be readily made of wire or cotton netting placed over pans or trays filled with earth in which the plants, used as food by the insects, are growing. These, and many other contrivances, for making observations and experiments upon living animals and plants in the laboratory are of the greatest value, as the chief stress should be laid upon this phase of the instruction.

DEALERS IN ANIMALS FOR CLASS WORK

Brimley, H. H. & C. S., Raleigh, N. C. (live and preserved material); Marine Biological Laboratory Supply Dept., Woods Hole, Mass. (preserved marine material); McCurdy, B. F. & Co., 312 E. 65th Place, Chicago (live material); Powers, H. H., Station A, Lincoln, Neb. (living hydra, etc., and miscellaneous slides).

ZOOLOGICAL SUPPLY DEPARTMENT OF THE UNIVERSITY OF MISSOURI

The Department of Zoology of the University of Missouri has frequently received from teachers in all parts of the State requests for dissection and demonstration material to be used in teaching this subject. These requests have been answered with references to dealers in such supplies, or with simple directions regarding the collection and preservation of the material which could be found near at home. But to secure supplies in small quantities from dealers at a distance was both troublesome and expensive, while the teachers were often unable, or had not the time, to obtain living or properly preserved material from the local fauna. Accordingly, a plan for establishing a zoological supply department at the University was submitted to superintendents of accredited schools. Since only favorable replies were received and since similar plans have been successfully carried out in other states, it was decided to establish the department.

The department is prepared to furnish to the accredited schools of the state living and preserved materials from the local land and fresh-water fauna, and also the marine forms that are ordinarily used. In addition to the forms used for student dissection, simple museum specimens and microscopic preparations may be secured. Furthermore, explanation of methods of collecting and preserving material will be made, in order to assist the schools in obtaining material locally. All supplies will be furnished *at cost,* and the schools will have the further advantage of low transportation charges and prompt delivery.

This department is not in operation between June 1st and October 1st. The current price list and further information may be obtained by addressing the Zoological Supply Dept., 509 South 9th St., Columbia, Mo.

DEALERS IN LABORATORY APPARATUS AND SUPPLIES FOR BOTANY AND ZOOLOGY

Bausch and Lomb Optical Co., Rochester, N. Y. (microscopes and supplies); Cambridge Botanical Supply Co., Cambridge, Mass. (general botanical equipment, preserved material and fresh marine algae); Drury, Miss E. M., 45 Munroe Street, Roxbury, Mass. (slides and botanical material); Eimer & Amend, 205-211 Third Ave., N. Y. (general apparatus, supplies, and reagents); Ernest Leitz, 30 E. 18th St., N. Y. (microscopes and supplies); Marine Biological Laboratory, Supply Department, Woods Hole, Mass. (marine material); Spencer Lens Co., Buffalo, N. Y.

(microscopes and supplies); Western Biological Supply Co., Station A, Lincoln, Neb. (zoological material and microscopic preparations).

PHYSIOLOGY

The apparatus and chemicals necessary for the accurate measurement and observation of the activity of such organs as the heart, respiratory system, muscles, nerves, etc., and for the chemical study of the blood, the digestive process, etc., can be had at a comparatively small cost. The lists given below contain some things for which the ingenious teacher may himself make very effective substitutes at little cost, save time and his own labor. The minimum outfit for effective work is as follows:

GENERAL EQUIPMENT

Student tables, size of top about 34x54, height 34 inches....	$100
Stools, two to each table..................................	
Gas, water, and electric connections for an electric clock....	
General chemical table and shelves........................	
General supply of chemicals	
Electric clock, or simple wall pendulum, beating seconds, with mercury contact, and electric connections...........	

GENERAL APPARATUS FOR DEMONSTRATION

1	mercury manometer and blood pressure outfit..............	5.00
1	set of test lenses for the eye..............................	6.00
1	color wheel, or a small electric motor, with set of color discs	7.00
	Assorted glass tubing	1.00
	Assorted rubber tubing	1.50
	Assorted corks	1.00
1	shellac outfit	1.00

SPECIAL SETS OF APPARATUS AND CHEMICALS

FOR EACH GROUP OF FOUR STUDENTS WORKING TOGETHER

For physiological experiments.

1	table, size about 34x54x34 inches..................$10.00 to	$ 20.00
2	stools, height 20 inches..................................	1.00
1	recording drum and clockwork............................	24.00
1	induction coil	7.00
1	platinum stimulating electrode	1.00
2	dry batteries	.50
2	porcelain base (knife edge), electric keys..................	.30
1	muscle lever	1.15
1	muscle clamp	1.00
100	weights, 10 gram, lead..................................	.30
1	heart lever, of straw	.00

1 heart lever holder (or use muscle lever holder)	$ 1.15
1 signal magnet (electric, for the time circuit)	1.05
1 tuning fork, 100 double vibrations a second	1.00
2 iron stands, heavy base (chemical stands will serve)	2.00
2 burette clamps, simple	.60
2 burette clamps, universal	.80
100 sheets glazed paper, 6x20 inches	.50

For physiological chemical experiments.

1 set chemical apparatus, containing 6-inch file, 100 filter papers, 4-inch funnel, bunsen burner, 100 c. c. graduated cylinder, 4-inch flat bottom evaporating dish, 300 c. c. flask, test tube rack and dozen test tubes, set of 6 beakers, 100° centigrade thermometer, costing in all about	6.00
1 set student chemicals containing starch, dextrine, dextrose, acetic acid, nitric acid, hydrochloric acid, picric acid, ammonia, caustic soda or potash, sodium chloride, magnesium sulphate, ammonium sulphate, calcium chloride, copper sulphate, sodium potassium tartrate, glycerine, pepsin, ptyalin, pancreatin and fibrin, costing in all about	6.00
1 set chemical reagent bottles	4.00
Total	$201.85

DEALERS IN APPARATUS

Harvard Apparatus Co., Back Bay P. O., Boston, Mass.; Eimer and Amend, New York City, N. Y.

DEALERS IN CHEMICALS

Mallinckrodt Chemical Co., St. Louis, Mo.; Merck & Co., St. Louis, Mo.

PHYSICAL GEOGRAPHY

FOR TWELVE PUPILS WORKING AT THE SAME TIME

GENERAL EQUIPMENT

A collection of common rocks and minerals	$ 2.50
Sun board	6.00
Six self-registering maximum and minimum thermometers	3.65
Sight compass	5.65
Rain gauge	2.75
Wind vane (made by students)	
Anemometer (made by students)	
Mason's hygrometer	5.00
Globe, 12 inch	6.00

Physical maps of the continents and the United States, in spring roller case	29.35

Daily and monthly weather maps. (The daily maps may be obtained from the nearest weather bureau station, the monthly from the Weather Bureau at Washington, D. C.)

TOPOGRAPHIC MAPS

Order maps from the United States Geological Survey, Washington, D. C. The topographic maps cost five cents each in lots of one hundred. The following list includes all maps necessary. The number of copies of each map needed will depend upon the number of pupils in the class and the plan of work. There should be one map for each two students, whether working in one section or more than one. If the class is divided into groups and each group studies different sheets, fewer copies of each will be needed.

Simple plain or plateau: Thibodeaux, Louisiana; Fargo, North Dakota; Bowling Green; Ohio; Coude, South Dakota; Chicago, Illinois.

Simple mountain ridge: Harrisburg, Pennsylvania; Delaware Water Gap, New Jersey-Pennsylvania.

Plain with young valleys: Wilson, New York; Fostoria, Ohio; Dublin, Ohio.

Mountains with shallow valleys: Shasta, California; Harper's Ferry, Virginia-Maryland.

Plains with well-defined valleys: Palmyra, Missouri; Wicomico, Maryland; Olivet, South Dakota.

Dissected mountains: Mt. Marcey, New York; White Mts., New Hampshire.

Dissected plains: Lancaster, Wisconsin; Versailles, Missouri; Hazard, Kentucky; Ironton, Ohio-Kentucky.

Past mature plains: Clinton, Missouri; Nevada, Missouri; O'Fallon, Missouri.

Plains with hills and valleys: Warrenton, Virginia; Frederick, Maryland.

Plains with hills: Eagle, Wisconsin; Oswego, New York; Baldinsville, New York.

Plains with mountain ridges and valleys: Harrisburg, Pennsylvania.

Maps of valleys: Map of alluvial valley of the Mississippi River; Kansas City, Missouri; Wheeling, West Virginia-Ohio; Niagara Falls, New York; Harpers Ferry, Virginia-Maryland; Albany, New York; Charleston, West Virginia; Hinton, West Virginia; Sullivan, Missouri; Marseilles, Illinois; St. Louis, Missouri; East and West sheets. Map of the United States showing the Mississippi, Potomac, Delaware and other river basins.

Ponded rivers: Norwich, Connecticut; Perch Lake, Michigan.

Drowned valleys: New London, Connecticut; Saybrook, Connecticut; Washington, D. C.; New York City, New York.

River deposits (flood plains): Marshall, Missouri; St. Louis, Missouri-Illinois; Kansas City, Missouri; Thibodeaux, Louisiana; Gibson, Louisiana; The Alluvial Valley of the Mississippi River.

Maps of recently drained lake bottoms or recently uplifted sea bottoms: Fargo, North Dakota-Minnesota; Chicago, Illinois; Fostoria, Ohio; Camden, New Jersey; Edenton, North Carolina; Trent River, North Carolina.

Wind deposits: Kingsley, Kansas; Brown's Creek, Nebraska; Campe Clark, Nebraska; Provincetown, Massachusetts.

Glacial deposits: Moraines: Eagle, Wisconsin; Charleston, Rhode Island; Brooklyn, New York; Plainfield, New Jersey. Drumlins: Oswego, New York; Baldwinsville, New York; Boston, Massachussets; Sun Prairie, Wisconsin. Sand and gravel plains: Jonesville, Wisconsin; Plainfield, New Jersey; Great Egg Harbor, New Jersey; Lynn, Massachusetts; Boston Bay, Massachusetts; Sandy Hook, New Jersey.

The following maps illustrate some of the erosive effects of glaciers, waves of seas and lakes:

U-shaped valleys: Leadville, Colorado (the high valleys); Watkins, New York; Hammondsport, New York.

Fiords: Methow, Washington; Stehekin, Washington; Juneau, Alaska.

Lakes: Webster, Massachusetts; Franklin, New Jersey; Paradox Lake, New Jersey; Plymouth, Massachusetts, Minneapolis, Minnesota.

Shore cliffs: Sandy Hook, New Jersey; San Francisco, California; Boston Bay, Massachusetts.

Volcanic deposits: Volcanic Cones: Mt. Shasta, California; Lassen Peak, California; Mt. Tabor, New Mexico.

Lava plains and plateaus: Modoc Lava Beds, California; Bisuka, Idaho.

Laccolite mountains: San Rafael, Utah; Henry Mountains, Utah.

Good illustrative maps: Dunlap, Illinois; Kanawha Falls, West Virginia; Hinton, West Virginia; Ocean, West Virginia; Chattanooga, Tennessee; McMinnville, Tennessee; Cleveland, Tennessee; Suwanee, Tennessee; Ringgold, Tennessee; Belchertown, Massachusetts; Northampton, Massachusetts; Springfield, Massachusetts; Charleston, West Virginia; Nichols, West Virginia; Echo Cliffs, Arizona; Tooele Valley, Utah; Kaaterskill, New York; Mt. Marcy, New York; Catskill, New York; Disaster, Nevada; Granite Range, Nevada; Harrisburg, Pennsylvania; Pine Grove, Pennsylvania.

CHARTS

Atlantic Ocean.	
Sailing charts, A, B, C, D, each	$ .50

General charts of the coast, Nos. 6, 7, 376, 11, 19, 21, each....$	.50
Coast charts, Nos. 105, 106, 120, 121, each..................	.50
Pacific Ocean.	
Sailing charts, S.	.50
General charts of the coast, Nos. 550, 6,000, 8,100, 8,200, each..	.50
Harbor chart, No. 5581	.50
One set tide tables, Atlantic Coast; U. S. Coast and Geodetic Survey	.25
One set tide tables, Pacific Coast; U. S. Coast and Geodetic Survey	.25
Weather maps, Order from U. S. Weather Bureau, St. Louis, Missouri.	

ADDITIONAL APPARATUS

The following additional apparatus, very desirable, but not essential, should be added as soon as possible.

Relief maps, by Prof. Harry Keeler, of the Englewood High School, Chicago, to illustrate typical regions in the different stages of development, making them especially valuable in Physical Geography. It will be noticed that the prices are about 50 per cent of those formerly charged for reliable maps.

SUBJECT	Size over all, inches	Horizontal Scale	Vertical Scale	Price Net	EXAMPLE
Niagara.......	38"x15.5"	1 in.=1 mile	4 to 1	$20.00	Water Falls, and Stream Erosion
Shasta.........	22.5"x17"	1 in.=1 mile	True Scale	17.50	A Young Volcanic Mountain
Crater Lake....	20"x16"	1 in.=1 mile	2 to 1	17.50	A Crater
Grand Canyon.	20.5"x17.5"	1 in.=4 miles	2 to 1	17.50	Weathering and Stream Erosion
Marshall, Mo...	21"x17"	1 in.=1 mile	2 to 1	17.50	A Graded River
Ottawa, Ill.....	21"x17"	1 in.=1 mile	2 to 1	17.50	Work of Young Stream
Teachers Model	24.5x15.5"			15.00	

Slated globe 10 in. with moveable semi-circle..................$	3.00
Series of lantern slides to illustrate the phenomena of Physical Geography. Selected and prepared by Wallace W. Atwood, of the University of Chicago, and Jane Perry Cook, of the Chicago Normal, with descriptive text for each slide. (Circular sent upon application.) Complete set, 550 slides, each..	.40

College bench lantern with objective, condensing lens and slide carrier. (Illuminant extra depending upon kind wanted)	$27.00
Helidon invented by Prof. J. F. Morse, of the Medill High School, Chicago, an adjustable appliance for demonstrating the apparent path of the sun through the sky at equinox and solstice times with reference to the horizon and zenith of an observer at any latitude. (Circular upon application.) Net..	10.00
Soil thermometer	1.10
Barograph (Duty free)	20.00
Thermograph (Duty free)	20.00

AGRICULTURE

FOR A CLASS OF SIXTEEN PUPILS

MATERIAL TO BE COLLECTED BY TEACHER AND STUDENTS AT THE BEGINNING OF THE YEAR

1 bushel clean sand.
1 bushel sandy loam soil.
1 bushel clay.
8 quarts leaf mold (well rotted).
1 bushel rich soil for use in growing house plants.

Samples of commercial fertilizer, with analysis and prices given.

Collection of economic seeds. (These may be secured free of U. S. Department of Agriculture. In ordering this collection, address U. S. Dept. of Agriculture, Seed Laboratory, Washington, D. C. When ordering send $1.50 to Mackall Bros., 9th and H. Streets, N. E., Washington, D. C. This is to pay for the tray and vials used in packing the collection. Notify the Department that the money has been sent to pay for tray and vials.)

Collections of economic seeds prepared by teacher and students.

Seeds of the following trees: oak, walnut, hickory, hazel, apple, pear, peach, cherry, plum, etc.

Cereals: corn, wheat, oats, rye, barley, rice, etc.

Grasses and clovers: red clover, alsike, white clover, alfalfa, timothy, millet, orchard grass, blue grass, Johnson grass, Bermuda grass, cowpeas, redtop, etc.

Common weeds: purslane, morning glory, Jamestown weed, cocklebur, cheat, ragweed, horseweed, etc.

EQUIPMENT TO BE PURCHASED

2 doz. student lamp chimneys,	$ 1.50
2 doz. wide-mouthed bottles, per doz. 26c, 1 oz	.52
2 doz. wide-mouthed bottles, per doz., 45c, 6 oz	.90
4 thistle tubes, 10c	.40

1 lb. glass tubing, one-fourth inch	$ .44
4 thermometers, chemical, centrigrade, at 60c	2.40
6 doz. test tubes, 8x1	3.00
1 "Cenco" trip scale	6.65
1 set weights	1.65
1 Babcock milk and cream tester	5.50
8 shallow pans, at 35c	2.80
4 glass funnels, 3-in., at 12c	.48
2 sieves, 20 mesh	6.45
2 sieves, 60 mesh	
1 sieve, 100 mesh	
1 lb. glass rods—small	.50
1 lb. glass tubing—small diameter	.50
8 tripod microscopes, 44c	3.52
1 soil augur	3.00
2 percolation cylinders	3.50
2 evaporation cylinders	5.00
2 graduated cylinders, 65c, 100 cc	1.30
3 blast lamps, gasoline, $2.75	8.25
	$58 26

(The apparatus listed above when purchased in one order will cost about $51.00, transportation charges prepaid.)

4 Mason's pint fruit jars.
4 doz. 4-in. flower pots with saucers.
3 doz. 6-in. flower pots with saucers.
16 heavy dinner plates.
16 panes of glass, 8x11.
1 tiling spade.
1 table, 3½ ft. x 12 ft.
1 suitable case for storing apparatus.

At least an acre of ground should be provided.

APPARATUS NOT REQUIRED, BUT VERY DESIRABLE

2 soil thermometers	$2.50
1 dissecting microscope	9.50
1 bucket sprayer	5.00

The apparatus may be purchased of the Central Scientific Company, Chicago, Ill.; the W. M. Welch Mfg. Co., Chicago, Ill., 100 Lake St., or any other standard scientific apparatus company.

MANUAL TRAINING

A UNIT IN WOODWORKING

MINIMUM INDIVIDUAL EQUIPMENT

1 bench and vise	$ 8.75
1 Bailey No. 4 smooth plane	1.60
1 2′ two fold rule	.12
1 12″ back saw	1.10
1 No. 162 Stanley marking gauge	.15
1 No. 20 Stanley try square	.20
1 sloyd knife 2½″ blade	.18
1 ¼″ firmer chisel	.30
1 1″ firmer chisel	.40
1 spoke shave, Stanley No. 64	.12
1 maple bench hook	.18
1 bench brush	.25
Total	$ 13.35

MINIMUM GENERAL EQUIPMENT

1 Disston No. 7 or Jennings' crosscut saw, 10 points, 24″	$ 1.25
1 Disston No. 7 or Jennings' rip saw, 8 points, 24″	1.25
1 bit brace, 8″ sweep	1.00
1 Miller's Falls hard drill, No. 2	1.30
1 keyhole saw	.40
1 14″ turning saw with frame	.90
1 screw driver, 4″ blade	.18
1 screw driver, 6″ blade	.20
2 6″ wing dividers	.30
2 6″ T bevels	.40
2 adz eye claw hammers, 10 oz	1.00
6 ¾″ gouges, outside ground	3.00
1 set auger bits	3.00
3 scrapers	.25
3 nail sets, assorted	.20
4 10″ hand screws	2.70
6 7″ hand screws	2.50
1 mounted oil stone	.75
1 steel oiler	.10
1 mounted grindstone	6.00
Total	$26.68

MEDIUM INDIVIDUAL EQUIPMENT

1 bench and vise	$ 10.00
1 jack plane, Bailey No. 5	1.80
1 block plane, Stanley No. 220	.45
1 2′ two fold boxwood rule	.12
1 12″ back saw	1.10
1 2½″ mallet	.15
1 marking gauge, Stanley No. 162	.15
1 try square, 6″ blade, Stanley No. 20	.20
1 6″ wing dividers	.15
1 sloyd knife, 2½″ blade	.18
1 screw driver, 4″ blade	.18
1 ¼″ dowel bit	.20
1 ½″ dowel bit	.30
1 ¼″ firmer chisel	.30
1 ½″ firmer chisel	.35
1 1″ firmer chisel	.40
1 spoke shave, Stanley No. 64	.12
1 maple bench hook	.18
1 bench brush, bristle	.25
Total	$16.58

MEDIUM GENERAL EQUIPMENT

3 Disston No. 7 or Jennings' crosscut saws, 10 points, 24″	$ 3.75
3 Disston No. 7 or Jennings' rip saws, 8 points, 24″	3.75
1 set auger bits, 3-16″ to 1″, inclusive	3.00
1 Miller's Falls hand drill, No. 2	1.30
1 keyhole saw	.40
1 14″ turning saw	.90
1 screw driver, 6″ blade	.20
4 6″ T bevels	.80
3 nail sets, assorted	.20
4 10 oz. adz eye claw hammers	2.00
3 bit braces, 8″ sweep	3.00
6 ¾″ gouges, outside ground	3.00
1 set J. S. Addis carving tools	4.00
1 framing square	1.10
4 scrapers	.35
6 10″ hand screws	4.00
6 7″ hand screws	2.50
2 carpenter's steel clamps, 48″	3.60
2 mounted oil stones	1.50
2 steel oilers	.20

1 mounted grindstone	$ 9.00
Total	$48.55

VERY COMPLETE INDIVIDUAL EQUIPMENT

1 bench and vise, with lockers	$ 16.50
1 Stanley "Bed Rock" jack plane, No. 605	2.10
1 Stanley block plane, No. 15	.80
1 2′ two fold rule	.12
1 12″ back saw	1.10
1 Disston No. 7 or Jennings' crosscut saw, 22″, 10 points	1.25
1 Disston No. 7 or Jennings' rip saw, 22″, 8 points	1.25
1 ratchet bit brace, 8″ sweep	1.50
1 10 oz. adz eye claw hammer	.50
1 2½″ mallet	.15
1 Stanley marking gauge, No. 165	.28
1 Stanley try square, 6″ blade	.20
1 6″ T bevel	.20
1 6″ wing dividers	.15
1 sloyd knife, 2½″ blade	.18
1 screw driver, 4″ blade	.18
1 ¼″ dowel bit	.20
1 ½″ dowel bit	.30
1 ¼″ firmer chisel	.30
1 ½″ firmer chisel	.35
1 1″ firmer chisel	.40
1 spoke shave, Stanley No. 64	.12
1 nail set	.08
1 maple bench hook	.18
1 bench brush (bristle)	.25
Total	$ 28.64

VERY COMPLETE GENERAL EQUIPMENT

1 Disston No. 7 or Jennings' crosscut saw, 8 points, 26″	$ 1.50
1 Disston No. 7 or Jennings' rip saw, 6 points, 26″	1.50
1 set auger bits, 3-16″ to 1″, inclusive	3.00
1 Clark's expansive bit	1.00
1 Miller's Falls hand drill No. 2	1.30
3 keyhole saws, assorted	.80
2 14″ turning saws with frames	1.80
1 Langdon mitre box with saw	9.35
1 drawing knife, 8″ blade	.95
1 framing square, rustless	1.10
1 Stanley universal plane with bits	12.00

6	1″ gouges, outside ground	$ 3.60
6	¾″ gouges, outside ground	3.00
1	set J. S. Addis carving tools, No. 12	5.75
6	scrapers, assorted	.50
6	brad awls, assorted	.25
1	Bailey No. 8 jointer	3.00
6	10″ hand screws with iron screws	4.80
6	8″ hand screws with iron screws	4.40
4	carpenter's steel clamps, 48″	7.20
2	oil stones, mounted	1.50
2	steel oilers	.20
1	mounted grindstone, treadle attachment	12.00
	Total	$ 80.50

In making an estimate of the cost of an equipment, about 10 per cent should be added to the estimates given here. This will be needed for extra and unforeseen wants.

DEALERS

Schroeter Bros., Hardware Co., 717-719 Washington Ave., St. Louis, Mo.; Simmons Hardware Co., St. Louis, Mo.; Orr & Lockett Hardware Co., 71-73 Randolph St., Chicago, Ill.; E. H. Sheldon & Co., 320 North May St., Chicago Ill.; Hammacher, Schlemmer & Co., 4th Ave. & 13th St., New York City; The Chas. A. Strelinger Co., 96 Bates St., Detroit, Mich.

A UNIT IN MECHANICAL DRAWING

FOR A CLASS OF TWENTY PUPILS WORKING AT THE SAME TIME

20	sets of drawing instruments	$ 60.00
20	T-squares (cherry)	8.00
20	Xylonite Triangles, 45, 7 in.	8.00
20	Xylonite Triangles, 30x60, 7 in.	7.00
20	white pine drawing boards, 20x25 inches	18.00
20	architects' triangular scales	8.50

Each pupil should possess the following:

1	dozen thumb tacks	.05
1	pencil and ink eraser	.05
1	sponge eraser	.10
1	sketch book, for pencil	.10
1	pencil, soft, finest grade, No. 2	.10
1	pencil, 4 H, for mechanical drawing	.05
1	bottle Higgins' black drawing ink	.25

Drawing paper in large sheets, size 19x24, of good quality, for mechanical drawing, may be had from 2 to 5c per sheet.

DEALERS IN DRAWING MATERIAL

The following firms are among those which are reliable: Eugene Dietzgen Co., Chicago; F. Weber & Co., St. Louis; A. S. Aloe Co., St. Louis; Keuffel & Esser Co., St. Louis.

HOUSEHOLD ARTS (DOMESTIC SCIENCE AND ART)

FOR SIXTEEN PUPILS WORKING AT THE SAME TIME

COOKING

The following list of equipment is intended to be suggestive. The prices quoted are only approximate. In the case of such things as desks, refrigerator, supply cabinet and cupboards, cheaper equipment may be secured, if necessary. Detailed information with regard to equipment may be found in *Equipment for Teaching Domestic Science* by Helen Kinne, Whitcomb & Barrows, Huntington Chambers, Boston, Mass. The price of this book is eighty cents.

	Gas range	$ 21.00
	Gasoline stove, with oven (if there is no gas)	10.00
16	individual stoves, each	.75
8	desks, each 5 ft. long, each	25.00
16	stools, each	.50
4	sinks, each	4.00
	Refrigerator	25.00
	Supply cabinet	10.00
	Grocery cupboard	5.00
	China cupboard	10.00
4	sets scales, each	3.00
4	microscopes, each	20.00
8	dishpans, each	.25
8	tin boxes for flour, each	.08
8	tin boxes for sugar, each	.08
8	plates for soap and sapolio, each	.15
100	test tubes	1.00
	Litmus paper	
	Box of corks	
	Box of matches	.03
8	thermometers, each	.30
4	shallow biscuit pans made to fit the oven	.40
8	biscuit cutters, each	.05
	Roasting pan	.25
2	deep iron kettles	.75
2	wire baskets, each	.10
2	draining spoons	.06

	Large grater		$ .05
2	large stew kettles, each		.50
2	large double boilers, each		.25
4	ice cream freezers, 1 qt.		5.00
2	doz. fruit jars		1.50
2	doz. jelly glasses		2.00
8	muffin rings		2.00
	Meat grinder		1.25
	Coffee pot (percolator)		3.50
	Flour sifter		.10
	Tea kettle		.75
6	small tin buckets		.30
	Large sauce pan		.25
	Carving knife		.25
	Tea pot		.25
2	scrubbing brushes, each		.15
40	dish cloths, linen, ¼ yard in length		2.00
50	dish towels, linen, 1 yard in length		7.50
16	sets of apparatus, as follows:		
	tablespoon	$ .06 2-3	
	2 teaspoons, each	.03 1-3	
	salt spoon	.05	
	wooden spoon	.05	
	fork	.07	
	spatula	.25	
	paring knife	.05	
	measuring cup	.08	
	mixing bowl	.50	
	large baking dish	.35	
	ramekin	.10	
	plate (porcelain)	.10	
	pie tin	.03	
	clover egg beater	.10	
	egg whip	.02	
	rolling pin	.30	
	molding board	.10	
	deep cake and bread pan	.10	
	2 sauce pans, each	.25	
	cover for sauce pans	.05	
	frying pan	.08	
	wire strainer	.10	
	double boiler	.25	

SEWING

This list, as the preceding one, is intended to be suggestive. The prices quoted are only approximate. In the case of tables, cabinets and teacher's desk, cheaper equipment may be secured.

4 tables, each 10 ft. in length, each		$16.00
16 chairs, each		.75
2 cabinets, each		10.00
1 teachers desk		15.00
1 mirror		6.00
4 sewing machines, each		25.00
16 sets as follows:		
12-inch ruler	$ .05	
yard ruler, metal edge	.20	
pair scissors	.75	
tape measure	.05	
pin cushion	.10	
emory	05	
work box	.10	

III

SUGGESTIONS FOR THE EQUIPMENT OF LIBRARIES

GENERAL INFORMATION

In accordance with the law approved March 19, 1901, it is made mandatory upon the district boards of directors to set aside, out of the levy for incidental purposes, not less than five nor more than twenty cents per pupil enumerated in the district each year, which shall be spent, under the direction of the board, in purchasing books, the first hundred of which shall be from a list selected by the State Library Board. (R. S. 1909, Sec. 8186.)

In addition to this provision, the qualified voters in each school district (outside of an incorporated city) have the power, at the annual meeting, by a majority of the votes cast, to vote such a sum as they may deem proper, not to exceed two mills on the dollar, for the purchase of books for a district library. (R. S. 1909, Sec. 8196.)

In cities containing 1,000 and less than 100,000 inhabitants, the Board of Education has power "to establish and maintain a library for the use of the public school district therein," and to appropriate the following sums therefor: 20,000 and under 100,000 inhabitants, $2,500; 5,000 and under 20,000, $500; 1,000 and under 5,000, $250. (R. S. 1909, Sec. 10871.)

This is, in brief, the state of the law in Missouri in reference to the school library. The list of books spoken of in the first paragraph, which may be obtained from the State Superintendent, contains largely books suited to the lower grades. It is with the hope of stimulating the growth of the high school libraries throughout the State and directing that growth in the right direction that these suggestions are made.

Books can generally be purchased to the greatest advantage through some large retail book shop. The firm of A. C. McClurg, 215 Wabash Avenue, Chicago, is recommended for domestic books and that of G. E. Stechert, 151 West 25th St., New York, for foreign books. Low discounts may usually be secured from local book-sellers. It is seldom of advantage to deal with the publisher direct. *If a large order is sent, a discount of about thirty per cent from the prices named in the following lists may be expected.* The discount will vary on different books and on some no discount can be given. In writing for books, one should be particular to state *exactly* what is wanted, giving author, title, edition, and publisher.

When the books arrive, they should be compared with the order and the bill, and entered in an accession book. This book, which can be obtained already ruled from the Library Bureau, 156 Wabash Ave., Chicago, is intended to be an exact record of the books in the library and is ruled for author, title, publisher, date, size, binding, house from which purchased and cost. This record is simply intended for business purposes. It is not a catalogue in any sense. One line is given to each volume and each line is numbered consecutively. Each volume, then, has a separate number which should be entered in some stated place on the volume itself, such as the foot of the page following the title.

Before the books are circulated, they should be marked indelibly in several places with the name of the library. A rubber stamp for this purpose can be had for a few cents. For example, the title page, the fifty-first page and the last page should be marked. It is a good idea to have a book plate printed and inserted on the inside cover of each book. The leaves of all uncut books should be cut.

If it is possible, a separate room should be set apart for the library. This room should be made attractive and kept open all day long as a study room. If there is no fund from which to pay a librarian, the library should be placed in charge of one of the teachers, who should be held responsible for it. Good aids for the person in charge of the library are Dana's *Library Primer,* Stearns' *Essentials in Library Administration,* Hitchler's *Cataloging for Small Libraries,* Kroeger's *Aids in Book Selection* and *Binding for Small Libraries* and Brown's *Mending and Repair of Books. The Library Primer,* which costs $1.00, can be obtained of the Library Bureau, Chicago. The other books in the list, which cost 15c each, can be obtained of The American Library Association, 78 E. Washington St., Chicago.

Every means should be used to encourage pupils to read. They should be referred to definite books frequently and should be shown the books by the teacher. Supplementary reading in moderate quantities should be assigned. Pupils should be permitted to take the books home. During the vacation when the school house is closed, the books should be removed to the home of some one who will care for them and issue them as desired by the residents of the district.

If the library is large enough to warrant the employment of a librarian, some one with a special library training should be employed. It is just as important that the librarian should have a special education as it is for the teacher. If a whole year cannot be given to the study, the librarian should take at least a course at some summer school of library economy.

Every library of over 1,000 volumes should be catalogued on cards. To be effective this work must be done by trained cataloguers. Card cases and other supplies can be had of the Library Bureau. A model catalogue can be secured from the Superintendent of Documents, Washington, D. C., by sending for a copy of the *A. L. A. Catalogue of* 8000

Volumes for a Popular Library, (price, $1.00). This is a most carefully selected list and is very useful as an aid in the selection of books. Printed cards of all the books listed can be obtained from the Library of Congress at a cost of two cents for each different card and one-half cent for each duplicate card. The *Handbook of Card Distribution,* which will be sent gratis, should be secured from the Library of Congress.

The Missouri Library Commission, Jefferson City, Missouri, will be glad to correspond with anyone who wishes suggestions regarding the establishment or administration of school libraries.

The following lists of books are suggested:

GENERAL REFERENCE BOOKS

The prefix * indicates that the book is especially valuable.

*Webster's *New International Dictionary,* (Springfield, Mass.) Merriam	$ 12.00
**New International Encyclopedia,* (22 Vols.), (N. Y.) Dodd, Mead	92.50
Lippincott's *New Gazetteer,* Philadelphia	10.00
*Rand-McNally's *Indexed Atlas of the World,* (2 Vols.)	18.50
Bartlett's *Familiar Quotations,* (Boston) Little	3.00
Stephen & Lee's *Dictionary of National Biography,* (22 Vols.), Macmillan	93.50

ENGLISH

The prefix * indicates that the book is especially valuable.

FOR REFERENCE

LANGUAGE AND RHETORIC

Abbott, E. A., *Shakespearian Grammar,* Macmillan	$ 1.50
Alden, R. M., *Introduction to the Study of Poetry,* Holt	1.25
Bradley, H., *The Making of English,* Macmillan	1.00
Bright & Miller, *Elements of English Versification,* Ginn	.80
Fowler, N. W. and F. G., *King's English,* Oxford Univ. Press	1.75
*Genung, J. F., *Working Principles of Rhetoric,* Ginn	1.40
*Greenough, B., and Kittredge, G. L., *Words and their Ways in English Speech,* Macmillan	1.10
*Hill, A. S., *Principles of Rhetoric,* New Edition, American Book Co.	1.20
Jespersen, O., *Growth and Structure of the English Language,* (N. Y.) Stechert	1.00
Johnson, C. F., *Forms of English Poetry,* American Book Co.	1.00
*Krapp, G. F., *Modern English,* Scribner	1.25

Lounsbury, T. R., *History of the English Language,* Holt	$ 1.12
Nesfield, J. C., *English Grammar Past and Present,* Macmillan	1.10
Skeat, W. W., *An Etymological Dictionary of the English Language,* (1910), Oxford University Press	9.50
*Skeat, W. W., *Principles of English Etymology,* (2 Vols.), Clarendon	5.35
Smith, L. P., *The English Language,* Holt	.50
Sweet, H., *New English Grammar,* (2 parts), Clarendon Press	2.65
*Whitney, W. D., *Essentials of English Grammar,* Ginn	.75
Wyld, H. C., *The Growth of English,* Dutton	1.00
Wyld, H. C., *Historical Study of the Mother Tongue,* Dutton.	2.00

BOOKS ON LITERATURE.

Adams, O. F., *Dictionary of American Authors,* Houghton	3.00
Alexander, W. J., *Introduction to Browning,* Ginn	1.00
Bates, Arlo, *Talks on the Study of Literature,* Houghton	1.50
Bradley, A. C., *Shakespearean Tragedy,* Macmillan	3.25
Bronson, W. D., *English Poems,* (4 Vols.), University of Chicago Press	6.00
Brooke, S. A., *English Literature from the Beginning of the Norman Conquest,* Macmillan	2.50
Child, C. G., *Early Plays,* (Riv. Ser.), Houghton	.40
Corson, H., *Introduction to Shakespeare,* Heath	1.50
Corson, H., *Introduction to the Study of Robert Browning's Poetry,* Heath	1.50
Dixon, W. M., *Tennyson Primer,* Dodd, Mead	1.25
Dowden, E., *Shakespeare: His Mind and Art,* Harper	1.75
English Men of Letters, ed. by J. Morley, (39 Vols.), Harper	29.25
Fairchild, A. H. R., *The Making of Poetry,* Putnam	1.50
Furnivall and Munro, *Shakespeare: Life and Work,* Cassell	.35
Gayley, C. M., *Classic Myths in English Literature,* Ginn	1.50
Gayley, C. M., *Representative English Comedies,* Macmillan	1.50
Gosse, E. W., *History of Eighteenth Century Literature,* Macmillan	1.50
Gummere, F. B., *Old English Ballads,* (Athen. Press) Ginn	.80
Gummere, F. B., *The Oldest English Epic,* Macmillan	1.10
Maccallum, M. W., *Shakespeare's Roman Plays and their Background,* Macmillan	2.50
Manly, J. M., *English Poetry,* Ginn	1.50
Manly, J. M., *English Prose,* Ginn	1.50
Minto, W., *Manual of English Prose Literature,* Ginn	1.50
Newcomer, A. G., *Twelve Centuries of English Prose and Poetry,* Scott, Foresman	1.75
Page, C. H., *Chief American Poets,* Houghton	1.75

Pollard, A. W., *English Miracle Plays,* Clarendon Press	$ 1.90
Pound, L., *The Periods of English Literature,* University of Nebraska Press	.75
Raleigh, W., *Shakespeare,* Macmillan	.50
Raleigh, W., *Wordsworth,* (London) Arnold	2.00
Ryland, T., *Chronolgical Outlines of English Literature,* Macmillan	1.75
Saintsbury, G., *History of Elizabethan Literature,* Macmillan.	1.75
Saintsbury, G., *History of Nineteenth Century Literature,* Macmillan	1.50
Schelling, F. E., *The Elizabethan Drama,* (2 Vols.), Houghton	7.50
Stedman, E. C., *American Anthology,* Houghton	3.00
Stedman, E. C., *Victorian Anthology,* Houghton	3.00
Taine, H., *History of English Literature,* Holt	1.75
Thayer, W. R., *Best English Plays,* Ginn	1.40
Tisdel, F. M., *Studies in Literature,* Macmillan	.90
Tolman, A. H., *Questions on Shakespeare,* University of Chicago Press Part I, 75c; Part II	1.00
Ward, T. H., *English Poets,* (4 Vols.), Macmillan	4.00
Wendell, B., *Literary History of America,* Scribner	3.00

ENGLISH CLASSICS

Addison, J., *Spectator,* Macmillan	1.50
Arnold, M., *Essays in Criticism,* (2 Vols.), Macmillan	3.00
Austen, J., *Works,* (5 Vols.), Putnam	2.50
Bacon, *Essays,* ed. by West, Putnam	1.00
Blackmore, *Lorna Doone,* Ginn	.65
Boswell, *Life of Johnson,* (2 Vols.), (Everyman's Lib.), Dutton	.70
Browne, Sir T., *Religio Medici* and *Urn Burial,* (Everyman's Lib.), Dutton	.35
Browning, R., *Complete Works,* (Cambridge ed.), Houghton..	3.00
Bryant, W. C., *Poetical Works* (Household ed.), Appleton	1.50
Bunyan, J., *Pilgrim's Progress,* (Everyman's Lib.), Dutton	.35
Burns, R., *Poems, Songs and Letters,* (Globe ed.), Macmillan	1.75
Burke, E., *Selected Works,* (3 Vols.), Macmillan	3.60
Byron, Lord, *Poems,* (Cambridge) ed.), Houghton	3.00
Carlyle, T., *Heroes and Hero Worship,* (Athen. Press), Ginn.	.80
Carlyle, T., *Sartor Resartus,* (Athen. Press), Ginn	.80
Chaucer, G., *The Student's Chaucer,* ed. by Skeat, Macmillan.	1.75
Clemens, S. L., (Mark Twain), *Works,* (Complete sets, 18 Vols.), Harper	33.50
Coleridge, S. T., *Poetical Works,* (Globe ed.), Macmillan	1.75

Cooper, J. F., *The Spy, The Pilot,* and the five *"Leather Stocking Tales,"* (5 Vols.), (Everyman's Library), Dutton	$ 1.75
Cowper, W., *Poetical Works,* (Globe ed.), Macmillan	1.75
Defoe, D., *Robinson Crusoe,* (Everyman's Library), Dutton	.35
De Quincey, T., *Confessions of an English Opium Eater* and *Select Essays,* (3 Vols.), Scribner	5.00
Dickens, C., *Works,* (20 Vols.), Macmillan	20.00
Dryden, J., *Poetical Works,* (Globe ed.), Macmillan	1.75
Evans, Mary A., ("George Eliot"), *Works,* (12 Vols. at .90), Harper	10.80
Emerson, R. W., *Works,* (5 Vols.), (Bohn Lib.), Bell	4.35
Goldsmith, O., *Miscellaneous Works,* (Globe ed.), Macmillan	1.75
Gray, T., *Selections,* (Athen. Press), Ginn	.80
Harte, B., *Complete Poems,* (Cabinet ed.), Houghton	1.00
Harte, B., *The Luck of Roaring Camp, etc.,* Houghton	1.00
Hawthorne, N., *Works,* (8 Vols.), (Popular ed.), Houghton	10.00
Holmes, O. W., *Works,* (14 Vols.), (Riverside ed.), Houghton	21.00
Howells, W. D., *A Hazard of New Fortunes,* (2 Vols.), Harper	1.50
Howells, W. D., *The Rise of Silas Lapham,* Houghton	1.50
Irving, W., *Works,* (10 Vols.), Crowell	10.00
Johnson, S., *Lives of the Poets,* (2 Vols.), World's Classics), Oxford Press	11.00
Keats, J., *Poetical Works,* (Globe ed.), Macmillan	
Kingsley, C., *Westward Ho,* Macmillan	1.00
Kipling, R., *Works,* (15 Vols.), Doubleday	15.00
Lamb, C., *Essays of Elia and Eliana,* Bell	1.00
Lamb, C., *Tales from Shakespeare,* Macmillan	1.50
Lanier, S., *Poems,* Scribner	2.00
Longfellow, H. W., *Complete Poetical and Dramatic Works,* (Cambridge ed.), Houghton	2.00
Lowell, J. R., *Poems,* (Household ed.), Houghton	1.50
Lowell, J. R., *Prose Works,* (7 Vols.), (Riverside ed.), Houghton	10.50
Macaulay, T. B., *Critical, Historical and Miscellaneous Essays,* (3 Vols), Houghton	3.75
Malory, Sir T., *Morte D'Arthur* (Globe ed.), Macmillan	1.75
Macpherson, J., *Ossian,* (Canterbury Poets), (London) Scott	.25
Meredith, G., *Works,* (16 Vols.), Scribner	24.00
Milton, J., *Poetical Works,* ed. by Beeching, Oxford Press, or by Masson, Macmillan	1.75
or by Moody, Houghton	2.00
Poe, E. A., *Complete Works,* (17 Vols.), (Virginia ed.), Crowell	21.00

Pope, A., *Poetical Works,* (Globe ed.), Macmillan	$ 1.75
Reade, C., *The Cloister and the Hearth,* Page	1.50
Ruskin, J., *Crown of Wild Olive, Ethics of the Dust, Sesame and Lilies,* (3 Vols.), Merrill	4.50
Rossetti, D. G., *Poems,* Crowell	.75
Scott, W., *Poetical Works,* (Globe ed.), Macmillan	1.75
Scott, W., *Waverly Novels,* (12 Vols.), Estes	12.00
Shakespeare, W., *Works,* ed. by Craig, (Oxford ed.), Clarendon Press	1.50
Shakespeare, W., *Works,* ed. by C. H. Herford, (Eversley Ed., 11 Vols.), Macmillan	10.00
Shelley, B. P., *Poetical Works,* (Globe ed.), Macmillan	1.75
Spenser, E., *Complete Works,* (Globe ed.), Mamillan	1.75
Stevenson, R. L., (27 Vols.), Scribner	27.00
Swift, J., *Guilliver's Travels,* ed. by Scott, Bell	1.00
Swift, J., *Tale of a Tub, etc.,* ed. by Scott, Bell	1.00
Tennyson, A., *Works,* (Globe ed.), Macmillan	1.75
Swinburne, A. C., *Works* (2 Vols.), McKay	3.00
Thackeray, W. M., *Complete Works,* (10 Vols), Estes	10.00
Thomson, J., *Poetical Works,* Oxford Press	1.00
Taylor, B., *Poetical Works,* (Household ed.), Houghton	1.50
Thoreau, H., *Walden,* Houghton	3.00
Walton, I., *Complete Angler,* (Everyman's Lib.), Dutton	.35
Webster, D., *Great Speeches and Orations,* Little	3.00
Whittier, J. G., *Complete Poetical Works,* (Cambr. ed.), Houghton	2.00
Wordsworth, W., *Poetical Works,* (Globe ed.), Macmillan	1.75

TRANSLATIONS

The Bible (Authorized Version), "International," Winston	1.50
The Modern Reader's Bible, ed. by R. G. Moulton, Macmillan	2.00
The Twentieth Century New Testament, Revell	1.00
The Odyssey, transl. by Palmer, Houghton	.75
The Iliad, transl. by Lang, Leaf and Myers, Macmillan	.80
The Judgment of Socrates, transl. by More, (Riv. Ser.), Houghton	.15
The Divine Comedy, transl. by Longfellow, (3 Vols.), Houghton	4.50
The Song of Roland, transl. by Butler, (Riv. Ser.), Houghton	.40
Don Quixote, transl. by Motteux, (2 Vols.), Macmillan	2.00
The Nibelungenlied, transl. by Shumway, Houghton	.75
Goethe's *Faust,* transl. by Taylor, Houghton	2.50
The Rubaiyat of Omar Khayyam, transl. by Fitzgerald, Dutton	1.00

The Kalevala, transl. by Kirby, (2 Vols.), (Everyman), Dutton	$ .70
The Mabinogion, transl. by Lady Guest, (Everyman), Dutton	.35

The larger publishing houses, both in this country and in England, bring out new editions of the standard authors from time to time, better edited or cheaper or otherwise more desirable than those formerly offered. For this reason it has not seemed advisable in all cases to specify editions. Book-dealers are always supplied with catalogs of the important publishers.

A great many of the classics listed above are to be found in the 500 volumes of the "Everyman's Library," published by Dent and sold in this country by Dutton, New York, at 35 cents a volume in cloth, and 65 cents in leather.

MATHEMATICS

American Mathematical Monthly, subscriptions to be sent to Professor B. F. Finkel, Drury College, Springfield, Mo., per year	$ 2.00
Ball, W. W. R., *Mathematical Recreations and Problems,* (1892) Macmillan	1.75
Ball, W. W. R., *Short Account of the History of Mathematics,* (1898) Macmillan	2.60
Breckenridge, Mersereau, and Moore. *Shop Problems in Mathematics,* Ginn	1.00
Cajori, F., *History of Mathematics,* (1894), Macmillan	3.50
Cajori, F., *History of Elementary Mathematics,* (1896), Macmillan	1.50
Clifford, W. K., *Common Sense of the Exact Sciences,* International Science Series), (1891), Appleton	1.50
Cobb, *Elements of Applied Mathematics,* Ginn	1.00
Dedekind, R., *Essays on the Theory of Numbers,* tr. by W. W. Beman, Chicago, Open Court	1.00
De Morgan, A., *Elementary Illustrations of the Differential and Integral Calculus.* (Reprint ed. with a bibliography of text-books of the calculus.) Chicago, Open Court	1.00
De Morgan, A., *Study and Difficulties of Mathematics,* Chicago, Open Court	1.25
Fine, H. B., *College Algebra* (1905), Ginn	1.50
Fine, H. B., *Number System of Algebra,* (1898), Heath	1.00
Gibson, G. A., *Elementary Treatise on Graphs,* (1904), Macmillan	1.00
Godfrey and Siddons, *Elementary Geometry, together with Solid Geometry,* Cambridge University Press	1.35

Hilbert, D., *The Foundations of Geometry,* tr. by E. J. Townsend, Chicago, Open Court	$ 1.00
Kent, *Mechanical Engineers' Pocket Book,* Wiley & Sons, N. Y. City	4.00
Klein, F., *Famous Problems of Elementary Geometry,* tr. by W. W. Beman and D. E. Smith, Ginn	.55
Lagrange, J. L., *Lectures on Elementary Mathematics,* tr. by T. D. McCormick, (2nd. ed.), Chicago, Open Court	1.00
Lodge, O., *Easy Mathematics, Principally Arithmetic,* (1905), Macmillan	1.10
Marsh, *Industrial Mathematics,* Wiley	2.00
Row, T. S., *Geometric Exercises in Paper-Folding,* ed. by W. W. Beman and D. E. Smith, Chicago, Open Court	1.00
School Science and Mathematics, Chicago, (a monthly journal; nine numbers. Official organ of the Missouri Society of Teachers of Mathematics and Science. Address Secretary, 208 Thilly Ave., Columbia, Missouri)	2.00
Schubert, H., *Mathematical Essays and Recreations,* (1898), Chicago, Open Court	.75
Schultze, Arthur, *The Teaching of Mathematics in Secondary Schools,* (1912), Macmillan	1.25
Siddons and Vassal, *Practical Measurements,* Cambridge Press	.45
Smith, D. E., *Teaching of Elementary Mathematics,* (1903), Macmillan	1.00
Trautwine, *Engineers' Pocket Book,* The John C. Trautwine Co., Philadelphia, Pa.	4.00
Young, J. W. A., *Teaching of Mathematics,* (contains extensive bibliographies), (1907), Longmans, Green	1.50

HISTORY

The prefix * indicates that the book is especially valuable; the prefix **, that it is almost essential and that there should be two or more copies in the library.

ANCIENT HISTORY

REFERENCE BOOKS

*Abbott, *Pericles,* (Heroes Series), Putnam	$ 1.50
*Abbot, *Roman Political Institutions,* Ginn	1.50
Baikis, *Story of the Pharaohs,* Macmillan	2.00
**Botsford, *A History of the Orient and Greece,* Macmillan	1.20
**Botsford, *The Story of Rome, as Greeks and Romans Tell It,* Macmillan	.90
**Botsford, *Source Book of Ancient History,* Macmillan	1.50

Breasted, *Story of the Ancient Egyptians,* Scribner	$ 1.25
**Bury, *A History of Greece,* Macmillan	1.75
Bury, *The Roman Empire to* 180, *A. D.,* American Book Co.	1.50
Capps, *From Homer to Theocritus,* Scribner	1.50
**Church, *Stories of the East, from Herodotus,* Dodd, Mead	1.00
*Davis, *Short History of the Roman Empire,* Macmillan	1.00
Fairley, transl., *Deeds of Augustus,* Longmans, Green	.60
**Fling, *Source Book of Greek History,* Heath	1.00
Fowler, *The City State of the Greeks and Romans,* Macmillan	1.00
*Fowler, *Caesar,* (Heroes Series), Putnam	1.50
**Gayley, *Classic Myths,* Ginn	1.50
Goodspeed, *History of the Babylonians and Assyrians,* Scribner	1.25
Granrud, *Roman Constitutional History,* Allyn & Bacon	1.25
Greenidge, *Handbook of Greek Constitutional History,* Macmillan	1.25
*Gulick, *The Life of the Ancient Greeks,* Appleton	1.40
Herodotus, Trans. by Rawlinson, (2 Vols.), (Everyman's), Dutton	.35
*Hodgkin, *The Dynasty of Theodosius,* Clarendon Press	1.50
Hodgkin, *Theodoric, the Ostrogoth* (Heroes Series), Putnam	1.50
Holm, *History of Greece,* (4 Vols.), Macmillan	10.00
**Homer, *The Iliad and Odyssey,* in translation, (2 Vols.), Macmillan	1.60
*How and Leigh, *History of Rome to the Death of Caesar,* Longmans	2.00
*Johnston, *The Private Life of the Romans,* Allyn & Bacon	1.50
**Jones, *The Roman Empire,* (Nations Series,) Putnam	1.50
*Kiepert, *Atlas Antiquus,* Sanborn	2.00
*Mackail, *Latin Literature,* Scribner	1.25
Mahaffy, *Story of Alexander's Empire,* (Nations Series), Putnam	1.50
*Mahaffy, *What Have the Greeks Done for Modern Civilization,* Putnam	2.50
*Marcus Aurelius, *Thoughts,* trans. by Long, Macmillan	1.00
**Maspero, *Life in Ancient Egypt and Assyria,* Putnam	1.50
Mommsen, *History of Rome,* (5 Vols.), Scribner	10.00
Morey, *Outlines of Greek History,* American Book Co.	1.00
Morey, *Outlines of Roman History,* American Book Co.	1.00
*Morris, *Hannibal,* (Heroes Series), Putnam	1.50
**Munro, *Source Book of Roman History,* Heath	1.00
*Murray, *Small Classical Atlas for Schools,* ed. by Grundy, Clarendon Press	1.50

**Oman, *History of Greece,* Longmans, Green	$ 1.50
*Oman, *Seven Roman Statesmen of the Later Republic,* Longmans, Green	1.60
**Pelham, *Outlines of Roman History, to* 476, *A. D.*, Putnam	1.75
**Plutarch, *Lives of Noble Greeks and Romans,* trans. by Dryden, revised by Clough, (3 Vols.), (Everyman's), Dutton	1.05
*Tacitus, *Works,* translated, (2 Vols.), Macmillan	2.00
Tarbell, *History of Greek Art,* Macmillan	1.00
Thucydides, trans. by Jowett, (Boston) Lathrop	3.00
*Tighe, *Development of the Roman Constitution,* (History Primers), American Book Co	.35
**Tozer, Classical Geography,* (History Primers), American Book Co.	.35
Tucker, *Life in Ancient Athens,* Macmillan	1.25
*Wheeler, *Alexander the Great,* (Heroes Series) Putnam	1.50
*Wright, *Short History of Greek Literature,* American Book Co.	1.50

MAPS AND CHARTS

Johnston, *Physical, Classical, and Historical Maps of Ancient World* (Chicago) Nystrom & Co. Prices from $3.00 up per map.	
Kiepert, *Classical Wall Maps,* Nystrom & Co. and Rand, McNally Co. Prices from $6.00 up per map.	
MacCoun, *Charts for Ancient and Classical History,* Silver Burdett	20.00
Shepherd, *Atlas of Ancient History,* Holt	2.50

MEDIAEVAL AND MODERN HISTORY

REFERENCE BOOKS

**Adams, *Growth of the French Nation,* Macmillan	1.25
Adams, *Civilization During the Middle Ages,* Scribner	2.50
*Adams, *Mediaeval Civilization,* (History Primers), American Book Co.	.35
Archer and Kingsford, *The Crusades,* (Nations Series), Putnam	1.50
Barry, *The Papal Monarchy,* (Nations Series), Putnam	1.50
Beazley, *Prince Henry the Navigator,* (Heroes Series) Putnam	1.50
**Bemont and Monod, *Mediaeval Europe,* Holt	1.60
Bryce, *The Holy Roman Empire,* Revised Edition, Macmillan	2.50
*Cutts, *Scenes and Characters of the Middle Ages,* Potts	3.75
**Davis, *Charlemagne,* (Heroes Series), Putnam	1.50

Dow, *Atlas of European History,* Holt	$ 1.50
Duncalf & Krey, *Parallel Source Book in Mediaeval History,* Harpers	1.10
*Duruy, *History of France,* trans. by Jameson, Crowell	2.00
Duruy, *History of the Middle Ages,* trans. by E. H. and M. D. Whitney, Holt	1.60
Duruy, *History of Modern Times,* 1454-1789, trans. by Grosvenor, Holt	1.60
**Eginhard, *Life of Charles the Great,* Harpers	.15
**Emerton, *Introduction to the Middle Ages,* Ginn	1.10
**Emerton, *Mediaeval Europe,* Ginn	1.65
Fletcher, *Gustavus Adolphus,* (Heroes Series), Putnam	1.50
*Fournier, *Napoleon the First,* Holt	2.00
*Fyffe, *History of Modern Europe,* Holt	1.75
**Gardiner, *The Thirty Years War,* (Epochs Series), Longmans	1.00
Gilman, *The Saracens,* (Nations Series), Putnam	1.50
Harrison, *William the Silent,* (Foreign Statesmen Series), Macmillan	.75
Hassall, *The French People,* (Great Peoples Series), Appleton	1.50
Hazen, *Europe Since* 1814, Holt	3.00
*Henderson, *A Short History of Germany,* Macmillan	2.50
*Hodgkin, *Charles the Great,* (Foreign Statesmen Series), Macmillan	.75
Hollings, *Renaissance and Reformation,* Macmillan	.90
*Hume, *Philip II. of Spain,* (Foreign Statesman Series), Macmillan	.57
Hume, *The Spanish People,* (Great Peoples Series), Appleton	1.50
*Jacobs, *Martin Luther,* (Heroes of the Reformation Series), Putnam	1.50
Johnson, *Normans in Europe,* (Epochs Series), Longmans, Green	1.00
*Johnson, *Age of the Enlightened Despot,* Macmillan	.90
*Lane-Poole, *Saladin* (Heroes Series), Scribner, Putnam	1.50
Lees, *Central Period of the Middle Age,* Macmillan	.90
Lodge, *A History of Modern Europe,* American Book Co.	1.50
*Lodge, *End of the Middle Age,* Macmillan	.90
Lodge, *Richelieu,* (Foreign Statesmen Series), Macmillan	.75
*Lowell, E. J., *The Eve of the French Revolution,* Houghton, Mifflin	2.00
Lowell, F. C., *Joan of Arc,* Houghton, Mifflin	2.00
*Marriott, *The Re-Making of Modern Europe,* Macmillan	.90
*Masson, *Mediaeval France* (Nations Series), Putnam	1.50
Masterman, *Dawn of Mediaeval Europe,* Macmillan	.90

*Mathews, *The French Revolution,* Longmans	$ 1.25
Morfill, *The Story of Russia* (Nations Series) Putnam	1.50
*Motley, *Peter the Great,* (English Classics Series), (N. Y.), Maynard, Merrill	.25
**Munro, *The Middle Ages,* Appleton	.90
**Munro & Sellery, *Medieval Civilization,* Century	1.90
**Ogg, *Source Book of Mediaeval History,* American Book Co.	1.50
Perkins, *Richelieu,* (Heroes Series), Putnam	1.50
Perry, *St. Louis* (Heroes Series), Putnam	1.50
*Putzger, *Historischer Schul Atlas,* (Leipsic) Velhagen and Klassing	1.00
Reddaway, *Frederick the Great and the Rise of Prussia,* (Nations Series), Putnam	1.50
**Robinson, *History of Western Europe,* Ginn	1.60
**Robinson, *Readings in European History,* (2 Vols.), Ginn	3.00
**Robinson, *Readings,* Abridged edition	1.50
**Robinson and Beard, *Development of Modern Europe,* (2 Vols), Ginn	3.00
*Robinson, *Readings in Modern European History,* (2 Vols.), Ginn	3.00
**Schwill, *History of Modern Europe,* Scribner	1.50
**Seebohm, *Era of the Protestant Revolution,* (Epochs Series), Longmans, Green	1.00
**Seignobos, *The Feudal Regime,* trans. by Dow, Holt	.50
Seignobos, *Europe Since* 1814, trans. by Macvane, Holt	3.00
*Sergeant, *Story of the Franks,* (Nations Series), Putnam	1.50
**Shepherd, *Historical Atlas,* Holt	3.00
**Symonds, *Short History of the Renaissance in Italy,* ed. by Pearson, Holt	1.75
Thatcher, *Short History of Mediaeval Europe,* Scribner	1.25
Thatcher and McNeal, *Source Book for Mediaeval History,* Scribner	1.85
**Thatcher and Schwill, *Europe in the Middle Ages,* Scribner	2.00
**Translations and Reprints from the Original Sources of European History,* (University of Pennsylvania), (7 Vols.), Longmans, Green	10.50
*Trenholme, *Syllabus for the History of Western Europe,* Ginn	.60
**Walker, *The Reformation,* Macmillan	1.50
*Willert, *Henry of Navarre,* (Heroes Series), Putnam	1.50
Wishart, *Monks and Monasteries,* Brandt	1.50
*Zimmer, *The Hansa Towns,* (Nations Series), Putnam	1.50

MAPS AND CHARTS

Johnston, *Political Wall Maps,* Nystrom & Co., prices from $3.00 up	
MacCoun, *Historical Charts for Mediaeval and Modern History,* Silver, Burdett	$ 20.00
Rand, McNally, *Political Wall Maps,* prices from $3.00 up....	
Spruner-Bretschneider, *Historical Maps,* 10 in series, Nystrom & Co. and Rand, McNally Co., prices from $60.00 up......	

ENGLISH HISTORY

REFERENCE BOOKS

*Acland and Ransome, *Handbook in Outline of the Political History of England,* Longmans, Green....................	2.00
*Bates and Coman, *English History Told by English Poets,* Macmillan	.60
**Bateson, *Mediaeval England,* (Nations Series), Putnam	1.50
*Beard, *Introd. to the English Historians,* Macmillan..........	2.00
*Cannon, *Reading References in English History,* Ginn.......	2.50
*Cheyney, *Industrial and Social History of England,* Macmillan	1.40
**Cheyney, *Readings in English History,* Ginn.................	1.60
*Colby, *Selections from the Sources of English History,* Longmans, Green	1.50
Creasy, *Rise and Progress of the British Constitution,* Appleton	1.50
*Cunningham and McArthur, *Outlines of English Industrial History,* Macmillan....................................	1.50
*Feilden, *A Short Constitutional History of England,* Ginn....	1.25
**Fletcher, *Introductory History of England,* Dutton & Co. (2 Vols)	3.50
Freeman, *Old English History,* Macmillan....................	1.50
Freeman, *Short History of the Norman Conquest,* Clarendon Press	.60
*Freeman, *William the Conqueror* (English Statesmen Series), Macmillan	.75
Froissart, *Chronicles,* trans. by Bourchier, Macmillan.........	1.25
*Froissart, *The Boy's Froissart,* ed. by Lanier, Scribner.......	2.00
*Gairdner, *Henry VII.,* (English Statesman Series), Macmillan	.75
*Gairdner, *Houses of Lancaster and York,* (Epochs Series), Longmans	1.00
**Gardiner, *Atlas of English History,* Longmans, Green........	1.50
*Gardiner, *The First Two Stuarts and the Puritan Revolution,* (Epochs Series), Longmans, Green.....................	1.00

**Gardiner, Student's History of England, Longmans, Green	$ 3.00
*Gibbons, *Industrial History of England,* Scribner	1.25
Green, *Readings from English History,* Harper	1.50
**Green, *Short History of the English People,* American Book Co.	1.20
**Green, Mrs. J. R., *Henry II.,* (English Statesman Series), Macmillan	.75
*Guest and Underwood, *A Handbook of English History,* Macmillan	.75
Harrison, *Oliver Cromwell,* (English Statesmen Series), Macmillan	.75
Henderson, *Side Lights on English History,* Holt	5.00
*Hill, *Liberty Documents,* Longmans, Green	2.00
*Jenks, *Edward Plantagenet,* (Heroes Series), Putnam	1.50
*Jenks, *Parliamentary England,* (Nations Series), Putnam	1.50
Jessopp, *The Coming of the Friars,* Putnams	1.25
*Kendall, *Source Book of English History,* Macmillan	.80
*Lee, *Queen Victoria,* Macmillan	3.00
Lee, G. C., ed., *Leading Documents of English History,* Holt	2.00
*Low and Pulling, *Dictionary of English History*, rev. ed., Cassell	2.50
Macaulay, *Critical and Historical Essays,* ed. by Trevelyan, Longmans, Green	3.00
Macaulay, *History of England* (various editions), (2 Vols.), Longsman, Green	2.00
McCarthy, *Story of England in the 19th Century,* (Nations Series), Putnam	1.50
McFayden, *Alfred, the West Saxon,* Dent	1.15
*Moberly, *The Early Tudors,* (Epochs Series), Longmans, Green	1.00
**Montague, *Elements of English Constitutional History,* Longmans, Green	1.25
*Moran, *Theory and Practice of the English Government,* Longmans	1.20
*Morley, *Walpole,* (English Statesmen Series) Macmillan	.75
Oman, *England in the 19th Century,* Longmans, Green	1.25
Oman, *History of England,* Holt	1.50
*Ransome, *Advanced History of England,* Macmillan	2.25
*Ransome, *Rise of Constitutional Government in England,* Longmans	2.00
*Rosebery, *Pitt,* (English Statesmen Series) Macmillan	.75
Skottowe, *Short History of Parliament,* Scribner	1.00
*Smith, Goldwin, *Three English Statesmen,* Macmillan	1.50
**Smith, *The United Kingdom* (2 Vols.), Macmillan	4.00

Stubbs, *Early Plantagenets,* (Epochs Series) Longmans, Green.	$ 1.00
**Terry, *History of England,* Scott, Foresman	2.00
*Tout, *Edward I.,* (English Statesman Series), Macmillan	1.00
**Traill, *Social England,* (6 Vols.), Putnam	21.00
*Traill, *William the Third,* (English Statesman Series), Macmillan	.75
*Trenholme, *Outline of English History,* Ginn	.50
*Warburton, *Edward III.,* (Epochs Series), Longmans, Green.	1.00
Warner, B. E., *English History in Shakespeare's Plays,* Longmans, Green	1.75

MAPS AND CHARTS

Johnston, *Wall Maps of British Isles and British Empire,* Nystrom & Co., prices $3.00 and up.

Rand, McNally, *Wall Maps of British Isles and British Empire,* prices $3.00 and up.

AMERICAN HISTORY

REFERENCE BOOKS

***American History Leaflets,* ed. by Hart and Channing, 33 Nos., (N. Y.), Simmons	3.30
Brady, *American and Colonial Fights and Fighters,* (2 Vols.), McClure	2.70
Brady, *Commodore Paul Jones,* (Great Commanders Series), Appleton	1.50
Brady, *Stephen Decatur,* (Beacon Biographies Series), Small, Maynard	.75
Brady, *The Conquest of the Southwest,* Appleton	1.25
*Brigham, *Geographic Influences in American History,* Ginn	1.25
*Bogart, *Economic History of the United States,* Longmans	1.75
*Brown, W. G., *Andrew Jackson,* (Riverside Biographies Series), Houghton	.50
Brown, *Stephen A. Douglass,* (Riverside Biographies Series), Houghton	.50
**Bryce, *American Commonwealth,* (2 Vols), Macmillan	4.00
**Caldwell, *American History: Unification and Expansion,* (Chicago) Ainsworth	1.10
*Caldwell, *Great American Legislators,* Ainsworth	.65
**Caldwell, *Survey of American History* (source extracts), (Chicago) Ainsworth	.50
*Caldwell and Persinger, *Source History of the United States,* Ainsworth	1.25
**Cambridge Modern History,* (Vol. VII), (The United States Series), Macmillan	4.00

**Channing, *The United States of America,* 1765-1865, (Cambridge Historical Series), Macmillan	$ 1.60
**Channing, *History of the United States for Schools,* Macmillan	1.50
**Channing and Hart, *Guide to Study of American History,* Ginn	2.00
**Coman, *Industrial History of the United States,* new ed., Macmillan	1.25
Dodge, *Bird's Eye View of the Civil War,* Houghton, Mifflin	1.00
*Elson, *History of the United States,* Macmillan	1.75
*Elson, *Side Lights on American History,* (2 pts), Macmillan	1.50
**Fairbanks, *Western United States,* Heath	.60
*Fisher, *The Colonial Era,* 1402-1756, Scribner	1.00
*Fiske, *Historical Writings,* (8 Vols.), Houghton, Mifflin	16.00
*Ford, P. L., *The Many Sided Franklin,* Century Co.	3.00
**Ford, *The True George Washington,* Lippincott	2.00
Ford, editor *The Federalist,* Holt	1.75
Frothingham, *Rise of the Republic of the United States,* Little, Brown	3.50
*Gordy, *History of Political Parties in the United States,* (2 Vols.), Holt	3.50
*Greene, *Historical View of the American Revolution,* Houghton, Mifflin	1.50
*Harding, *Select Orations of American Political History.* Macmillan	1.25
*Hart, *American History Told by Contemporaries,* (4 Vols.), Macmillan	8.00
*Hart, *Epoch Maps Illustrating American History,* Longmans, Green	.50
**Hart (editor), *Epochs of American History,* (3 Vols.), Longmans, Green	3.75
Hart, *Foundations of American Foreign Policy,* Macmillan	1.50
*Hart, *Source Book of American History,* Macmillan	.60
Hart (editor), *The American Nation:. A History from Original Sources, by Associated Scholars,* (28 Vols.), Macmillan	42.00
**Higginson and Macdonald, *History of the United States,* Harper	2.00
**Hill, *Liberty Documents,* Longmans	2.00
Hinsdale, *How to Study and Teach History, with Particular Reference to the History of the United States,* Appleton	1.50
Hinsdale, *Old Northwest,* Silver, Burdett	1.75
Hodges, *William Penn,* (Riverside Biog. Series), Houghton, Mifflin	.50
*Hosmer, *History of the Louisiana Purchase,* Appleton	1.25

Hosmer, *Samuel Adams* (American Statesmen Series), Houghton, Mifflin	$ 1.25
*Hosmer, *Short History of the Mississippi Valley,* Houghton, Mifflin	1.20
Hovey, *Stonewall Jackson,* (Bacon Biog. Series), Small, Maynard	.75
*James and Mann, *Readings in American History,* Scribner	1.50
Johnston, *General Washington,* (Great Commanders Series), Appleton	1.50
*Johnston, Alex., editor, *American Orations,* (4 Vols.), Putnam	5.00
*Johnston, *History of American Politics,* Holt	.80
*Lecky, *The American Revolution,* ed. by Woodburn, Appleton	1.25
Lee, *General Robert E. Lee,* (Great Commanders Series), Appleton	1.50
Lighton, *Lewis and Clark,* (Riverside Biog. Series), Houghton, Mifflin	.50
*Lodge, *Alexander Hamilton,* (American Statesmen Series), Houghton, Mifflin	1.25
*Lodge, *Daniel Webster,* (American Statesmen Series), Houghton, Mifflin	1.25
*Lodge, *George Washington,* (2 Vols.), (American Statesmen Series), Houghton, Mifflin	2.50
*Lodge, *History of English Colonies in America,* Harper	3.00
Lodge, *Story of the Revolution,* Scribner	3.00
Macdonald, *Select Documents, etc., Illustrative of the History, of the United States,* 1606-1898, (3 Vols), Macmillan	6.25
Maclay, *History of American Privateers,* Appleton	3.50
*McMaster, *Life of Benjamin Franklin,* Houghton, Mifflin	1.25
McMaster, *History of the People of the United States,* (7 Vols.), (6 pub.), Appleton	17.50
*McMaster, *With the Fathers,* Appleton	1.50
*Macy, *Political Parties in the United States,* 1846-61, Macmillan	1.25
Madison, *Papers* ,(3 Vols), (N. Y.), Langley	6.00
Mahan, *Admiral Farragut,* (Great Commanders Series), Appleton	1.50
Mahan, *Gulf and Inland Waters,* (Navy in Civil War Series), Scribner	1.00
*Morse, *Abraham Lincoln,* (2 Vols), (American Statesmen Series), Houghton, Mifflin	2.50
*Morse, *Thomas Jefferson,* (American Statesmen Series), Houghton, Mifflin	1.25
*New England History Teachers' Association, *History Syllabus for Secondary Schools, Part IV, on American History,* Heath	.15

*Nicolay, *Outbreak of Rebellion,* Scribner	$ 1.00
*Nicolay, *Abraham Lincoln: A Short Life,* Century Co	2.40
*Ogg, *Opening of the Mississippi,* Macmillan	2.00
***Old South Leaflets,* ed. by Mead (about 150 Nos., 6 Vols.), Old South Meeting House (Boston)	9.00
Parkman, *Works,* (12 Vols.), Little, Brown	18.00
*Parkman, *Half Century of Conflict,* (2 Vols), Little, Brown	5.00
Parkman, *Jesuits in North America,* Little, Brown	2.00
**Parkman, *La Salle and the Discovery of the Great West,* Little, Brown	2.00
*Rhodes, *History of the United States from the Compromise of 1850,* (7 Vols.), Macmillan	14.00
Roosevelt, *Naval War of 1812,* Putnam	2.50
Roosevelt, *Thomas H. Benton,* (American Statesmen Series), Houghton, Mifflin	1.25
Roosevelt, *Winning of the West,* (Sagamore Series), (6 Vols.), Putnam	3.00
*Schouler, *Alexander Hamilton,* (Beacon Biog. Series), Small, Maynard	.75
*Schouler, *History of the United States Under the Constitution,* (6 Vols.), Dodd, Mead	13.50
*Schouler, *Thomas Jefferson,* (Makers of American Series), Dodd, Mead	1.00
Schurz, *Henry Clay,* (American Statesmen Series), Houghton-Mifflin	2.50
*Scudder, *Men and Manners in America One Hundred Years Ago,* Scribner	1.25
*Semple, *American History, and its Geographic Conditions,* Houghton, Mifflin	3.00
Sloane, *The French War and the Revolution,* Scribner	1.00
**Sparks, *Expansion of the American People,* Scott, Foresman	1.50
**Sparks, *The Men Who Make the Nation,* Macmillan	2.00
**Sparks, *The United States of America,* 1775-1897, (2 Vols.), (Nations Series), Putnam	2.70
**Stanwood, *History of the Presidency,* Houghton, Mifflin	2.50
Sumner, *Alexander Hamilton,* (Makers of America Series), Dodd, Mead	1.00
Sumner, *Andrew Jackson,* (American Statesmen Series), Houghton, Mifflin	1.25
*Taussig, *Tariff History of the United States,* new ed., Putnam	1.25
*Thwaites, *Daniel Boone,* Appleton	1.00
*Thwaites, *Father Marquette,* Appleton	1.00

*Thwaites, *How George Rogers Clark Won the Northwest, etc.,* McClurg	$ 1.20
Trent, *Robert E. Lee,* (Beacon Biog. Series), Small, Maynard	.75
**Southern Statesmen of the Old Regime,* Crowell	1.75
Tyler, *Patrick Henry,* (American Statesmen Series), Houghton, Mifflin	1.25
*Walker, *Making of the Nation,* Scribner	1.00
Warner, *Captain John Smith,* (American Worthies Series), Holt	1.25
*Wilson, Woodrow, *A History of the American People,* (5 Vols), Harper	17.50
Wilson, *George Washington,* Harper	1.50
*Winsor, *Christopher Columbus,* Houghton, Mifflin	4.00
Winsor, *Mississippi Basin: the Struggle Between England and France,* 1697-1763, Houghton, Mifflin	4.00
*Winsor (ed.), *Narrative and Critical History of America,* (8 Vols.), Houghton, Mifflin	44.00
Winsor, *Reader's Handbook of the Revolution,* Houghton Mifflin	1.25
*Winsor, *Westward Movement,* 1763-1798, Houghton Mifflin	4.00
*Woodburn, *American Republic and its Government,* Putnam	2.00
*Wright, *Industrial Evolution of the United States,* Scribner	1.25

MAPS AND CHARTS

Atkinson-Mentzer, *Charts for American History,* Atkinson, Mentzer & Grover	15.00
Foster, *Historical Maps for American History,* Rand, McNally	20.00
Hart, *History Aids (Charts for United States History),* Nystrum & Co.	4.00

GENERAL REFERENCE WORKS

As the lists given above are special in character, the following general reference works of value might be mentioned as desirable in connection with history courses:

**American Historical Review,* pub. quarterly, Amer. Hist. Assoc., (Wash.)	$ 3.00
American Year Book, pub. annually, Appleton	2.50
Bourne, *The Teaching of History and Civics,* (American Teachers Series), Longmans, Green	1.50
Brewer, *Historic Note Book,* Lippincott	3.50
**Century Dictionary of Proper Names,* Century Co	10.00
*Day, *History of Commerce,* Longmans	2.00
English Historical Review, (pub. quarterly), Longmans, Green, per year	5.00

*George, _Relations of History and Geography,_ Clarendon Press.	$ 1.10
Historical Sources in Schools, Macmillan	.50
History Syllabus for Secondary Schools, New England History Teachers Association, Heath	1.20
**_History Teachers Magazine,_ pub. monthly, McKinley Co. (Phila.)	2.00
Larned, _History for Ready Reference,_ (6 Vols), (Springfield, Mass.), Nichols	30.00
New International Encyclopedia, (22 Vols.), Dodd, Mead (or other good standard encyclopedia such as the new Britannica).	92.50
Ploetz, _Epitome of Ancient, Mediaeval, and Modern History,_ 2d ed. by Tillinghast, Houghton, Mifflin	3.00
Report of the Committee of Seven, _The Study of History in Schools,_ Macmillan	.50
Statesman's Year Book, pub. annually, Macmillan Co.	3.50

AMERICAN GOVERNMENT (CIVIL GOVERNMENT)

The most essential books are indicated by the prefix ** and present the minimum library which should be possessed by a secondary school. Books next in importance are indicated by the prefix * and every effort should be made to secure these as well as the remaining volumes in the list.

Historical works have not been included as it is assumed that these will be selected from the list of reference works for American History. Among the books in that list special attention is called to such collections as _Old South Leaflets,_ Hill's _Liberty Documents_ and Macdonald's _Select Charters and Other Documents Illustrative of American History, 1606-1898._

**Ashley, R. L., _The American Federal State,_ (1910), Macmillan	$ 2.00
Baldwin, Simeon E., _The American Judiciary,_ (1905), Century	1.25
**Beard, Charles A., _American Government and Politics,_ (1910), Macmillan	2.10
**Beard, _Readings in American Government and Politics,_ (1909), Macmillan	1.90
Beard & Schulz, _Documents on the Initiative, Referendum and Recall,_ (1912), Macmillan	2.00
Bradford, Ernest S., _Commission Government in American Cities,_ (1912), Macmillan	1.25
**Bryce, James, _American Commonwealth,_ (2 Vols.), (1910), Macmillan	4.00
*Childs, Richard S., _Short Ballot Principles,_ (1911), Houghton	1.00

*Cleveland, Frederick A., *The Growth of Democracy in the United States,* (Chicago, 1898), Quadrangle Press	$ 1.50
*Croly, Herbert D., *The Promise of American Life,* (1909), Macmillan	2.00
Dole, Charles F., *The American Citizen* (1891), Heath	.80
Ely, Richard T., *Taxation in American States and Cities,* (1888), Crowell	1.75
*Fairlie, John A., *Local Government in Counties, Towns, and Villages,* (1906), Century	1.25
Fairlie, *Municipal Administration,* (1901), Macmillan	3.00
*Fairlie, *The National Administration of the United States,* (1905), Macmillan	2.50
Finley, J. H., *The American Executive and Executive Methods,* (1908), Century	1.25
Fiske, John, *Civil Government in the United States Considered with Some Reference to Its Origin,* (1904), Houghton	1.00
*Follett, Mary Parker, *The Speaker of the House of Representatives* (1902), Longmans	1.75
Ford, Henry Jones, *The Rise and Growth of American Politics,* (1898), Macmillan	1.50
*Goodnow, F. J., *City Government in the United States,* (1904), Century	1.25
*Harrison, Benjamin, *This Country of Ours,* (1903), Scribner.	1.50
**Hart, Albert Bushnell, *Actual Government as Applied under American Conditions,* (1904), Longmans	2.00
*Hart, *Manual of History, Diplomacy, and Government of the United States,* (Cambridge, Mass., 1908), Harvard University Press	2.00
Hart, *Practical Essays on American Government,* (1893), Longmans	1.50
**Hinsdale, Burke Aaron, *The American Government, National and State,* American Book Co	1.25
Jones, Chester L., *Readings on Parties and Elections in the United States,* (1912), Macmillan	1.60
**Macey, Jesse, *Our Government,* (1901), Ginn	.75
*Macy, *Party Organization and Machinery,* (1904), Century	1.25
Munro, William B., *Government of American Cities,* (1912), Macmillan	2.25
McClain, Emlin., *Constitutional Law in the United States,* (1910), Longmans	2.25
***Official Manual of the State of Missouri,* (published biennially by the Secretary of State, Jefferson City), Free	
*Ostrogorski, M., *Democracy and the Party System in the United States,* (1910), Macmillan	1.75

*Reinsch, Paul S., *American Legislatures and Legislative Methods,* (1907), Century	$ 1.25
*Reinsch, Paul S., *Readings on American Federal Government,* (1909), Ginn	3.30
*Reinsch, *Readings on American State Government,* (1911), Ginn	2.25
*Roosevelt, Theodore, *American Ideals and Other Essays,* (1902), Putnam	1.50
Rowe, L. S., *Problems of City Government,* (1908), Appleton.	1.50
Smith, J. Allen, *The Spirit of American Government,* (1907), Macmillan	1.25
**Statistical Abstract of the United States,* (published annually by the Bureau of Statistics, Department of Commerce and Labor, Washington). Free.	
*Stimson, F. J., *The American Constitution,* (1908), Scribner..	1.25
United States Civil Service Commission, (Annual Report) (Washington).	
*Willoughby, W. F., *Territories and Dependencies of the United States,* (1905), Century	1.25
**Willoughby, W. W., *Rights and Duties of American Citizenship,* (1898), American Book Co	1.00
*Willoughby, W. W., *The American Constitutional System,* (1904), Century	1.25
*Wilson, Woodrow, *The State,* (1902), Heath	2.00
*Wilson, *Congressional Government,* (1900), Houghton	1.25
*Wilson: *Constitutional Government in the United States,* (1908), Lemcke	1.50
Woodburn, J. A., *The American Republic and Its Government,* (1903), Putnam	2.00
*Zeublin, Charles, *American Municipal Progress,* (1903), Macmillan	1.25

GREEK AND LATIN

EDITIONS, TRANSLATIONS AND SPECIAL WORKS

GREEK

The prefix * indicates that the book is especially valuable.

Aeschylus, *The Tragedies,* ed. with English Commentary by F. A. Paley, (4th ed., 1879), Macmillan	$ 2.75
Aeschylus, *The Tragedies,* trans. by E. H. Plumptre, (1890), Heath	1.25
Aeschylus, *The Tragedies,* trans. by Stewart Blackie, (Everyman's), Dutton	.35

Aeschylus, *The Tragedies,* trans. by E. H. Plumptre, (1882), Geo. Routledge and Sons	$ 1.50
Demosthenes. *Orations,* trans. by C. R. Kennedy, (5 Vols), (1906), (London), Geo. Bell	5.00
Euripides, *The Tragedies,* trans. by various authors, (2 Vols.), (Everyman's), Dutton	.70
Euripides, *The Tragedies,* with English commentary by F. W. Paley, (2d ed.), (3 Vols.), (London) Whitaker	6.00
Euripides, *The Tragedies,* trans. by A. S. Way, (4 Vols.), Macmillan	6.00
Hesiod, ed. with English commentary by F. A. Paley, (2d Ed.), Macmillan	1.75
Hesiod, trans. by G. A. Elton, (1894), Geo. Routledge & Sons.	.50
Homer, *Iliad,* ed. by Walter Leaf, (2nd ed.), (2 Vols), (1902), Macmillan	6.00
Homer, *Odyssey,* ed. with English notes by Merry and Riddell, (Bks. I-XII), (2nd Ed.), (Oxford) Clarendon	4.00
Homer, *Odyssey,* ed. with English notes by Merry and Riddell, by D. B. Munro, (1901), (Oxford) Clarendon	4.00
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**International French-English Dictionary,* invaluable because of its having the pronunciation of all words given in phonetic spelling, Hinds & Noble	$ 3.00
*Lanson, *Hist. de la Lit. Française,* (Paris) Hachette	7 francs
**L'Echo des Deux Mondes,* a monthly journal, (Chicago), A. C. Babize & Co., per year	$ 1.50
Le Maitre Phonétique, the best journal for the study of accurate speech, not only in French but in all the more important modern languages. (Address: Rue de la Madeleine, Bourg-la-Reine, Siene, France), per year	7 francs
**Le Petit Larousse,* (1 Vol.)	6.50 francs
Matzke, *French Pronunciation,* 2d edition, is very useful, Holt	$ .25
Michaelis-Passy, *Dict. Phonétique Française,* (Paris) Le Soudier	5 francs
Nyrop, *Grammaire Historique de la Langue Française,* (2 Vols.), (1904), (Paris)	15 francs
*Parton, *French Parnassus,* Houghton, Mifflin	$ 1.50
Passy, P., *Le Français Parlé,* (Leipzig) Reisland	2.50 francs
Passy, *Les Sons du Français,* (Paris) Didot	1.50 francs
*Pellissier, *Précis de l'Histoire de la Lit. Française*	4 francs
Petit de Julleville, *Hist. de la Langue et de la Lit. Française,* (8 Vols.), (Paris) Armand Colin	126 francs
Rambeau-Passy, *Chrestomathie Phonétique,* (Paris) Le Soudier	6 francs
Revue des Deux Mondes, Paris, bi-monthly, per year	62 francs
*Skeat's *Etymological Dictionary,* invaluable for showing the relationship between French and English words; Clarendon Press,	$11.00

LITERATURE

A library should, of course, contain a considerable number of standard works of French literature. There are so many of value to select from that special books or authors are not listed here.

PHONOGRAPHS

One of the most desirable aids to a correct pronunciation is the phonograph. A teacher can not possibly give all the time necessary to secure good pronunciation in an average class, but this machine proves an admirable substitute, when conscientiously and continuously used. Good companies that sell or lease phonographs and the necessary disks for the study of a modern language are The United States School of Languages, Annapolis, Md., and the International College of Languages, Putnam Building, New York. A machine with a set of elementary disks and the corresponding text can be bought for about $45. The set of advanced records costs $10, and a third set of difficult French words costs $5. The same school also has sets of records for Spanish.

SPANISH

In addition to a collection of the standard authors and a phonograph with disks, the following brief list of desirable volumes may be given:

Diccionario de la Real Academia, (Madrid) Hernando....	25 pesetas
(Double the price here given if not paid in advance; postage extra.)	
Velásquez de la Cadena, *Diccionario Esp. Inglés,* (2 Vols), Appleton ....$	6.00
Of smaller and cheaper dictionaries, Appleton's *New Spanish Dictionary* will be found usable....	2.00
Fitzmaurice-Kelly, *History of Spanish Lit.* (For beginners, the English edition; for advanced classes, the more complete edition; translated by Bonilla y San Martín), (Madrid) España Moderna....	10 pesetas
Hume, *Modern Spain,* (Nations Series), (London) Unwins.$	1.25

Lemcke and Buechner's *Catalogue Raisonné of Spanish Literature* (New York) will be found invaluable as a guide in selecting the best Spanish books, newspapers, and periodicals.

PHYSICS

Ames, J. S., *Text-book of General Physics,* (1904), American Book Co. ....$	1.60
Aryton, W. E., *Practical Electricity,* (1900), Cassell....	2.00
Boys, C. V., *Soap Bubbles,* (1900), (London) S. P. C. K....	.50
Cajori, F. F., *History of Physics,* (1899), Macmillan....	1.60
Derr, *Photography for Students of Physics and Chemistry,* Macmillan	1.40
Duff, A. W., *Text-book of Physics,* (1912), Blakiston....	2.75
Edser, E., *Light for Students,* (1903), Macmillan	1.50
Edser, E., *Heat for Advanced Students,* (1901), Macmillan..	1.00
Everett, J. D., *C. G. S. System of Units,* (1891), Macmillan..	1.25
Forbes, G., *Course of Lectures on Electricity,* (1888), (London), Longmans	1.00

Ganot, A., *Elementary Treatise on Physics,* 17th ed., (1906), Longmans	$ 2.50
Glazebrook, R. T., *Mechanics and Hydrostatics,* Macmillan	2.50
Glazebrook, R. T., and Shaw, W. N., *Practical Physics,* (4th ed.), (1893), (London), Longmans	2.50
Hastings, *Light,* Scribner	2.50
Houston and Kennelly, *Elementary Electrical Series,* (10 Vols), *Magnetism, The Electric Motor, The Electric Telegraph, The Electric Telephone, Electric Street Railways,* etc., (New York), McGraw and Hill, per volume	1.00
Larden, W., *Electricity,* Longmans	1.75
Maxwell, J. C., *Theory of Heat,* (1897), (London), Longmans	1.50
Michelson, *Light Waves and their Uses,* University of Chicago Press	2.00
Miller, D. C., *Laboratory Physics,* (1903), Ginn	2.00
Nichols, E. L., *Laboratory Manual of Physics,* (Vol. 1), Macmillan	3.00
Perry, J., *Spinning Tops,* (1901), (London), S. P. C. K.	.50
Poyser, A. W., *Magnetism and Electricity,* Longmans	1.50
Smithsonian, Physical Tables, Smithsonian Institute	2.00
Stewart, B., and Gee, W. W., *Lessons in Elementary Practical Physics,* (1 Vol.), (1898), Macmillan	1.50
Taylor, Sedley, *Sound and Music,* (London) Macmillan	2.25
Thomson, J. J., *Electricity and Matter,* (1904), Scribner	1.25
Thompson, S. P., *Elementary Lessons in Electricity and Magnetism,* (1892), Macmillan	1.40
Thompson, S. P., *Light, Visible and Invisible,* (1897), Macmillan	1.50
Tyndall, J., *Heat as a Mode of Motion,* (1895), Appleton	2.50
Tyndall, J., *Sound,* (1895), Longmans	2.00
Watson, W., *Text-book on Physics,* Longmans	3.50
Wood, R. W., *Physical Optics,* (1905), Macmillan	3.50
Wright, L., *Optical Projection,* Longmans	2.25
Zahm, J. A., *Sound and Music,* (1892), McClurg	3.00

CHEMISTRY

Armitage, F. A., *History of Chemistry,* (1906), Longmans	1.60
Bailey, E. H. S., *Sanitary and Applied Chemistry,* (1906), Macmillan	1.40
Bird, R. M., *Modern Science Reader,* Macmillan	1.10
Dobbin, L., and Walker, J., *Chemical Theory for Beginners,* Macmillan	.70
Duncan, R. K., *The Chemistry of Commerce,* (1907), Harper	2.00
Faraday, M., *Chemical History of a Candle,* Harper	.85

Holleman, A., *Organic Chemistry,* Wiley	$ 2.50
Kahlenberg and Hart, *Chemistry and Daily Life,* Macmillan	1.25
Lassar-Cohn, *Chemistry in Daily Life,* Lippincott	1.50
Meyer, E. von, *History of Chemistry,* (1898), Macmillan	4.50
Newth, G. S., *Text-book of Inorganic Chemistry,* (1894), Longmans	1.75
Olsen, *Quantitative Analysis,* Van Ostrand	4.00
Ostwald, W., *Conversations in Chemistry,* (1905), (N. Y.), Wiley	1.50
Picton, H. W., *Story of Chemistry,* (1892), (London) Isbister	.85
Ramsay, W., *Gases of the Atmosphere,* (1896), Macmillan	1.50
Reychler, A., *Outlines of Physical Chemistry,* Macmillan	1.00
Roscoe, H. E., *Life and Experiences,* (1906), Macmillan	4.00
Shenstone, *The Methods of Glass Blowing,* Longmans	1.50
Smith, A., *General Inorganic Chemistry,* (1906), Century	2.25
Snyder, H., *Chemistry of Plant and Animal Life,* (1903), Macmillan	1.40
Snyder, H., *Chemistry of Soils and Fertilizers,* (1899), (Easton) Chemical Pub.	1.50
Sutton, *Volumetric Analysis,* Blakiston	5.50
Thompson, S. P., *Michael Faraday: Life and Work,* (1898), Macmillan	1.25
Thorpe, T. E., *Essays in Historical Chemistry,* Macmillan	4.00
Treadwell-Hall, (Vol. I), *Qualitative Analysis,* Wiley	3.00
Treadwell-Hall, (Vol. II), *Quantitative Analysis,* Wiley	4.00

The laboratory manuals of Allan, Miss Blanchard, and Vulté on Household and Applied Chemistry will afford suggestions for supplementary experiments that may be assigned to the more rapid workers in the class.

GENERAL BIOLOGY, BOTANY AND ZOOLOGY

GENERAL BIOLOGICAL REFERENCES

Bateson, W., *Mendel's Principles of Heredity,* Putnam	3.50
Bower, F. O., *The Origin of a Land Flora,* (1908), Macmillan	5.50
Darwin, C., *Origin of Species,* (1892), Appleton	2.00
Davenport, E., *Principles of Breeding,* (1908), Ginn	2.50
Hertwig, R., *General Principles of Zoology,* (1897), Holt	1.60
Hodge, C. F., *Nature Study and Life,* (1902), Ginn	1.50
Jordan and Kellogg, *Evolution and Animal Life,* Appleton	2.50
Kerner, A., von M., *Natural History of Plants,* tr. by F. W. Oliver, (2 Vols.), (1895), Holt	15.00

Metcalf, M. M., *Outline of the Theory of Organic Evolution,* (1904), Macmillan	$ 2.50
Punnett, R. C., *Mendelism,* (1909), (N. Y.) Wiltshire Book Co.	.50
Romanes, G. J., *Darwin and After Darwin,* (2 Vols.), Vol. I—*The Darwinian Theory,* (1892), (Chicago) Open Court	2.00
Sedgwick, W. T. & Wilson, E. B., *General Biology,* (2d ed.), (1895), Holt	1.75
Thomson, J. A., *Heredity,* (1908), Putnam	3.50
Wallace, A. R., *Darwinianism* (1890), Macmillan	1.75
Walter, H. E., *Genetics* (1913), Macmillan	1.50

The teacher should have access to the following:

Lloyd, F. E., and Biglow, M. A., *The Teaching of Biology in the Secondary School* (1904), Longmans	1.50
Nature-study Review: A Journal Devoted to all Phases of Nature-study in Elementary Schools, 41 North Queen St., Lancaster, Pa. Per Vol. (6 nos.)	1.00

BOTANY

ELEMENTARY TEXT AND REFERENCE BOOKS

Atkinson, G. F., *Elementary Botany,* rev. ed., (1905), Holt	1.50
Atkinson, G. F., *Botany for High Schools,* (1910), Holt	1.25
Bailey, L. H., *Lessons with Plants,* (1898), Holt	1.10
Bailey, L. H., *Garden Making,* Macmillan	1.00
Barnes, C. R., *Outlines of Plant Life,* (1900), Holt	1.10
Bergen, J. Y., *Elements of Botany,* rev. ed., (1904), Ginn	1.30
Bergen, J. Y., and Davis, B. M., *Principles of Botany,* (1906), Ginn	1.50
Buchanan, E. D. and R. E., *Household Bacteriology,* (1913), Macmillan	2.25
Caldwell, O. W., *Handbook of Plant Morphology,* (1904), Holt	1.00
Coulter, J. M., *A text-book of Botany,* (1906), Appleton	1.25
Coulter, J. M., *Plants—A text-book of Botany* (1901), Appleton	1.25
Coulter, J. M., Barnes, C. R., and Cowles, H. C., *A Text-book of Botany,* (1910), American Book Co	3.50
Duggar, B. M., *Fungous Diseases of Plants,* (1909), Ginn	2.00
Leavitt, R. G., *Outlines of Botany,* (1901), American Book Co.	1.00
Lipman, J. G., *Bacteria in Relation to Country Life,* 2nd ed., (1909), Macmillan	1.50

MacDougal, D. T., *Experimental Plant Physiology,* (1898), Holt	$ 1.00
Peirce, G. J., *A Text-book of Plant Physiology,* (1903), Holt	2.00
Pinchot, G., *A Primer of Forestry,* Bul. 24, Bureau of Forestry, (Washington)	
Robinson, B. L., and Fernald, *Gray's New Manual of Botany,* (7th edition), (1908), American Book Co.	2.50
Schimper, A. F. W., *Plant Geography*, tr. by Fischer, (1903), Oxford Press	12.75
Strasburger, E., Schenck, H., Jost, L., and Karsten, G., *A Text-book of Botany,* 4th Eng. edition, translated by W. H. Lang, (1912), Macmillan	5.00

ADDITIONAL TEXTS, FLORAS, AND APPLIED WORKS

The following should be added to the above list, if possible:

Andrews, E. F., *Botany All the Year Round,* (1903), American Book Co.	1.00
Atkinson, G. F., *College Botany,* (1905), Holt	2.00
Atkinson, G. F., *Studies of American Fungi*: *Mushrooms—Edible, Poisonous, etc.,* (1900), (Ithaca) Andrus & Church	3.00
Bailey, L. H., *Survival of the Unlike,* (1896), Holt	2.00
Bailey, L. H., *Plant Breeding,* (1906), Macmillan	1.00
Bergen, J. Y., *Foundations of Botany,* Ginn	1.50
Britton, N. L., *N. A. Trees,* (1908), Holt	7.00
Campbell, D. H., *Mosses and Ferns,* (1905), Macmillan	4.00
de Candolle, *Origin of Cultivated Plants,* (1906), Appleton	2.00
Chamberlain, C. J., *Methods in Plant Histology,* (2nd ed.), (1905), Chicago University Press	2.25
Conn, H. W., *Agricultural Bacteriology,* (2nd ed.), (1910), (Philadelphia) Blakiston	2.50
Darwin, C., *Insectivorous Plants,* (1892), Appleton	2.00
Darwin, C., *Power of Movement in Plants,* (1892), Appleton.	2.00
Darwin, C., *Cross and Self Fertilization in the Vegetable Kingdom,* (1895), Appleton	2.00
Duggar, B. M., *Plant Physiology,* (1911), Macmillan	1.50
Farmers' Bulletins, U. S. Dept. of Agr., Washington, D. C., (free).	
Freeman, E. M., *Minnesota Plant Diseases,* Minnesota Botanical Survey, (1905), (St. Paul).	
Ganong, W. F., *The Living Plant,* (1913), Holt	3.50
Gifford, J., *Practical Forestry,* (1902), Appleton	1.20
Goebel, K., *Outlines of Classification and Special Morphology,* (Oxford) Clarendon Press	5.25

Hard, M. A., *Mushrooms,* (1908), (Kirkwood, Mo.) Author	$ 4.75
Jordan, E. O., *A Text-book of General Bacteriology,* (1909), Saunders	3.00
Lubbock, J., *Flowers, Fruits and Leaves,* (1886), Macmillan	1.25
Stevens, W. C., *Introduction to Botany,* (1906), Heath	1.50
Stevens, W. C., *Plant Anatomy,* (2nd ed. rev.), (1910), Blakiston	2.00
Stevens, F. L., and Hall, J. G., *Diseases of Economic Plants,* (1910), Macmillan	1.50
Tubeuf and Smith, W. G., *Diseases of Plants Induced by Cryptogamic Parasites,* (1897), Longmans	5.50
Underwood, L. M., *Our Native Ferns and Their Allies,* (1900), Holt	1.00
Underwood, L. M., *Moulds, Mildews and Mushrooms,* (1899), Holt	1.50
Vines, H. S., *Students' Text-book of Botany* (1895), Macmillan	3.75

Many bulletins of the Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C., are extremely valuable in high school work and should be obtained when possible.

ZOOLOGY

ELEMENTARY TEXTS AND REFERENCE BOOKS

Holmes, S. J., *The Biology of the Frog,* (1906), Macmillan	1.60
Jordan, D. S., and Kellogg, V. L., *Animal Life: A First Book of Zoology,* (1900), Appleton	1.20
Jordan, D. S., and Heath, H., *Animal Forms: A Second Book of Zoology,* (1902), Appleton	1.10
Jordan, D. S., Kellogg, V. L., and Heath, H., *Animals* (consisting of *Animal Life* and *Animal Forms* bound in one volume), (1903), Appleton	1.80
Jordan, D. S., Kellogg, V. L., and Heath, H., *Animal Studies: A Text-book of Elementary Zoology,* (1903), Appleton	1.25
Jordan, D. S., and Price, G. C., *Animal Structures: A Laboratory Guide Designed to Accompany Animal Studies,* (1903), Appleton	.50
Linville, H. R., and Kelly, H. A., *A Text-book in General Zoology,* (1906), Ginn	1.50
Needham, J. G., *General Biology,* (1910), Comstock	2.00
Parker, T. J., and W. N., *Practical Zoology,* (1908), Macmillan	2.60
Pratt, H. S., *A Course in Invertebrate Zoology,* (1902), Ginn	1.25

Pratt, H. S., *A Course in Vertebrate Zoology,* (1905), Ginn	$ 1.50
Sedgwick, W. T., and Wilson, E. B., *General Biology,* (1895), Macmillan	1.75
Smallwood, W. M., *A Text-book of Biology,* (1913), Lea & Febiger	2.75
Thomson, J. A., *The Story of Animal Life,* Scribner	1.50
Thomson, J. A., *The Science of Life,* (1899), (N. Y.) Stone	1.25

ADDITIONAL TEXTS AND REFERENCE BOOKS

The following books should be added, if possible, to the above list:

Davison, A., *Mammalian Anatomy, with Special Reference to the Cat,* (1903), Blakiston	1.50
Hegner, R. W., *College Zoology,* (1912), Macmillan	2.60
Hertwig, R., ed. by J. S. Kingsley, *A Manual of Zoology,* (1912), Holt	3.00
Hornaday, W. T., *Taxidermy and Zoological Collecting,* (1891), Scribner	2.50
Hough, T., and Sedgwick, W. T., *The Human Mechanism,* Ginn	2.40
Kellicott, W. E., *The Social Direction of Human Evolution,* Appleton	1.25
Kingsley, J. S., *Comparative Anatomy of Vertebrates,* (1912), Blakiston	2.25
Lubbock, J., *On the Senses, Instinct and Intelligence of Animals, with Special Reference to Insects,* (Internat. Sci. Ser.), (1888), Appleton	1.75
Marshall, C. E., *Microbiology,* (1912), Blakiston	2.50
Parker, T. J., and Haswell, W. A., *A Text-book of Zoology,* (2 Vols), (1910), Macmillan	9.00

BOOKS ON SPECIAL SUBJECTS

Insects and Spiders

Benton, F., *Honey Bee,* U. S. Dep't of Agriculture, Division of Entomology, New Ser., Bulletin No. 1	.15
Emerton, J. H., *Spiders, Their Structure and Habits,* (1890), Whidden	1.50
Folsom, J. W., *Entomology, with Special Reference to its Biological and Economic Aspects,* (1906), Blakiston	3.00
Holland, W. J., *The Butterfly Book,* (1899), Doubleday, Page	3.00
Holland, W. J., *The Moth Book,* (1903), Doubleday, Page	4.00
Howard, L. O., *The Insect Book,* (1902), Doubleday, Page	3.00
Howard, L. O., *Mosquitoes,* (1901), McClure	1.50

Kellogg, V. L., *American Insects,* (1905), Holt	$ 5.00
Lubbock, J., *Ants, Bees and Wasps,* (International Science Ser.), (1882), Appleton	2.00
Miall, L. C., *Natural History of Aquatic Insects,* (1895), Macmillan	1.75
Peckham, G. W., and E. G., *Wasps, Social and Solitary,* (1905), Houghton	1.50
Riley, C. V., *Directions for Collecting and Preserving Insects,* (1892), Smithsonian Institute	.25
Scudder, S. H., *Butterflies: Their Structure, Changes and Life Histories,* (1889), Holt	1.50

Crustacea, Worms, Mollusks, Echinoderms and Coelentrates.

Brooks, W. K.,*The Oyster,* (1905), Johns Hopkins Press	1.00
Darwin, C., *Formation of Vegetable Mold through the Action of Worms, with Observations on Their Habits,* (1892), Appleton	1.50
Huxley, T. H., *The Crayfish: An Introduction to the Study of Zoology,* (International Science Ser.), (1895), Appleton	1.75
Hyatt, A., *Commercial and Other Sponges,* (Guides for Science Teaching), (1893), Heath	.20

Vertebrates

Bailey, F. M., *Handbook of Birds of the Western United States,* (1902), Houghton	3.50
Blanchan, N., *Birds that Hunt and Are Hunted,* (1898), (N. Y.), Doubleday	2.00
Chapman, F. M., *Color Key to North American Birds,* (1903), Doubleday	2.50
Chapman, F. M., *Bird Life: A Guide to the Study of our Common Birds,* (1897), Appleton, Without colored plates	1.75
With colored plates	5.00
Coward, T. A., *The Migration of Birds,* (1912), Cambridge University Press	.40
Dugmore, A. R., *Bird Homes,* (1900), Doubleday	2.00
Jordan, D. S., *A Guide to the Study of Fishes,* (1905), Holt	12.00
Jordan, D. S., *Manual of the Vertebrates of the Northern United States,* (9th ed.), (1900),McClurg	2.50
Jordan, D. S., and Evermann, B. W., *American Food and Game Fishes,* (1902), Doubleday, Page	4.00
Lankester, E. R., *Extinct Animals,* (1905), Holt	1.75
Marshall, A. M., *The Frog,* (1912), Macmillan	1.10
Reed, C. A., *North American Birds' Eggs,* (1904), Doubleday	2.50

Stone, W., and Cram, W. E., *American Animals,* (1902), Doubleday	$ 3.00

Evolution and Heredity

Crampton, H. E., *The Doctrine of Evolution,* (1911), Columbia University Press	1.50
Darbishire, A. D., *Breeding and the Mendelian Discovery,* (1912), Cassell	2.00
Darwin, Charles, *The Origin of Species,* Appleton	2.00
Darwin, Charles, *Animals and Plants under Domestication,* Appleton	5.00
Doncaster, L., *Heredity in the Light of Recent Research,* (1912), Cambridge University Press	1.00
Jordan, D. S., and Kellogg, V. L., *Evolution and Animal Life,* (1907), Appleton	2.50
Kellicott, W. E., *The Social Direction of Human Evolution,* (1911), Appleton	1.50
Punnett, R. C., *Mendelism,* (1911), Macmillan	1.25
Romanes, G. J., *Darwin and After Darwin: I. The Darwinian Theory,* (1910), Open Court	4.00
Thomson, J. A., *Heredity,* (1908), Murray	3.50
Walter ,H. E., *Genetics, An Introduction to the Study of Heredity,* (1913), Macmillan	1.50

PHYSIOLOGY

ELEMENTARY TEXT AND REFERENCE BOOKS

Budgett, *Essentials of Physiology,* Saunders	1.00
Colton, *Physiology, Experimental and Descriptive,* Heath	1.15
Eddy, *General Physiology and Anatomy,* American Book Co.	1.20
Fitz, *Physiology and Hygiene,* Holt	1.12
Gulick Hygiene Series, Ginn	
I. Gulick, *Good Health*	.40
II. Gulick, *Emergencies*	.40
III. Jewett, *Town and City*	.50
IV. Jewett, *The Body at Work*	.50
V. Jewett, *Control of Body and Mind*	.50
Hewes, *High School Physiology,* Am. Book Co	1.00
Hough and Sedgwick, *The Human Mechanism,* Ginn	2.00
Huxley, *Lessons in Elementary Physiology,* edited by Lee, Macmillan	1.40
Jones and Stephens, *Outlines of Physiology,* (Phila.) Blakiston	1.50

Krohn, *Graded Lessons in Hygiene,* Appleton	$ .60
Martin, *The Human Body,* (Advanced course), Holt	2.50
Ritchie, *Human Physiology,* (Yonkers, N. Y.), World Book Co.	.80
Schenk and Güber, *Human Physiology,* tr. by Zoethout, Holt	1.75
Walters, *Physiology and Hygiene,* Heath	1.20

LABORATORY GUIDES

Beddard, Edkins, Flack, Hill, MacLeod, and Pembrey, *Practical Physiology,* Longmans, Green	4.00
Gorham and Tower, *Dissection of the Cat,* Scribner	.90
Hawk, *Practical Physiological Chemistry,* (Phila.), Blakistons	2.50
Howell, *Dissection of the Dog,* Holt	1.00
Lombard, *Laboratory Work in Physiology,* (Ann Arbor, Mich.), Geo. Wahr	1.50
Stirling, *Outlines of Practical Physiology,* (Phila.), Blakiston	2.00

ADVANCED TEXTS AND REFERENCE BOOKS

Gerrish, *Text-book of Anatomy,* (Phila.) Lea Bros	6.50
Greene, *Kirke's Handbook of Physiology* (With Laboratory Outlines), (N. Y.) Wm. Wood	3.00
Hall, *Text-book of Physiology,* (Phila.) Lee Bros	4.00
Howell, *Text-book of Physiology,* Saunders	4.00
Hutchison, *Food and Dietetics,* Wm. Wood	3.00
Jackson, Morris' *Human Anatomy,* (Phila.), Blakiston	6.00
Schaefer, *Text-book of Physiology,* (2 Vols.), Macmillan	15.00
Simon, *Physiological Chemistry,* Lee Bros	3.25
Sollman, *Text-book of Pharmacology,* Saunders	4.00
Stewart, *Manual of Physiology* (With Laboratory Outlines), Wm. Wood	4.00

PHYSICAL GEOGRAPHY

TEXT BOOKS

Davis, *Physical Geography,* Ginn	1.40
Dryer, *Physical Geography,* American Book Co	1.20
Emerson *Manual of Physical Geography,* Macmillan	1.40
Fairbanks, *Practical Physiography,* Allyn	1.60
Gilbert and Brigham, *Physical Geography,* Appleton	1.25
Salisbury, *Physiography,* Holt	3.50
Tarr, *Physical Geography,* Macmillan	1.00

GENERAL REFERENCE BOOKS

Brigham, *Elementary Geology,* Appleton	$ 1.40
Chamberlain and Salisbury, *Geology,* (Vol. I), Holt	4.00
Davis, *Meteorology,* Ginn	2.50
Le Conte, *Geology,* Appleton	4.00
Physiography of the U. S., American Book Co	1.50
Russell, *Glaciers of N. A.,* Ginn	1.75
Russell, *Lakes of N. A.,* Ginn	1.50
Russell, *Rivers of N. A.,* Putnam	2.00
Shaler, *Aspects of the Earth,* Scribner	2.50
Shaler, *Sea and Land,* Scribner	2.50
Interpretation of Topgraphic Maps, U. S. Geological Survey, Professional paper No. 60, (free).	
Waldo, *Elementary Meterology,* American Book Co	1.50

AGRICULTURE

BOOKS THAT ARE ESSENTIAL

Bailey, *Fruit Growing,* Macmillan	1.50
Bailey, *Plant Breeding,* Macmillan	1.25
Bowman and Crossley, *Corn,* Bowman and Crossley, Ames, Iowa	2.00
Brigham, *Progressive Poultry Culture,* Torch Press	1.30
Burkett, *Soils,* Orange, Judd Co	1.00
Day, G. E., *Productive Swine Husbandry,* Lippincott	1.50
Henry, W. A., *Feeds and Feeding,* W. A. Henry, Madison, Wis.	2.25
Hunt, *Forage and Fibre Crops*	1.75
King, *The Soil,* Macmillan	1.50
Lyon and Fippin, *Principles of Soil Management,* Macmillan	1.75
Mumford, *Beef Production,* H. W. Mumford, Urbana, Ill.	1.50
Plumb, *Types and Breeds of Farm Animals,* Ginn	2.00
Powell, *Co-operation in Agriculture,* Macmillan	1.50
Vivian, *First Principles of Soil Fertility,* Orange, Judd Co.	1.00
Warren, *Farm Management,* Macmillan	1.75
Wilson, *Evolution of a Country Community,* The Pilgrim Press	1.25

At least one good farm paper	1.00

BOOKS THAT ARE DESIRABLE, BUT NOT ABSOLUTELY ESSENTIAL

FOR GENERAL USE

Bailey, *Cyclopedia of American Agriculture* (four volumes), Macmillan	$ 20.00
Bailey, *Farm Buildings*, Sanders Pub. Co. (Chicago)	2.00
Bailey, *Insect Pests of Farm, Orchard and Garden*, Wiley	3.00
Bailey, *Vegetable Gardening*, Macmillan	1.50
Davidson, *Agricultural Engineering*, Webb Publishing Co.	1.50
Osterhaut, *Experiments with Plants*, Macmillan	1.25
Roberts, *The Horse*, Macmillan	1.25
Smith, H. R., *Profitable Stock Feeding*, H. R. Smith, Anthony Park, Minn.	1.50
Voorhees, *Fertilizers*, Macmillan	1.25
Whitson and Woolster, *Soils and Soil Fertility*, Webb Publishing Co.	1.25

TEXT BOOKS

It is believed that better work will be done, if the teacher will use a number of good texts. If four or five copies of each of the following books are purchased, it will be unnecessary for the students to purchase any textbook.

Ferguson, *Elementary Principles of Agriculture*, Ferguson Publishing Co.	1.00
Goodrich, *First Book of Farming*, Doubleday, Page	1.00
Halligan, *The Fundamentals of Agriculture*, Heath	1.20
Jackson and Daugherty, *Agriculture*, Orange, Judd	1.50
Mayne and Hatch, *High School Agriculture*, American Book Co.	1.00
Warren, *Elements of Agriculture*, Macmillan	1.10

LABORATORY MANUALS

It will be necessary for each student to purchase a manual for his own use. The manuals named below are considered the best published and one of them should be adopted:

Call and Schafer, *A Laboratory Manual of Agriculture*, Macmillan	.92
Elliff, J. D., *A Unit in Agriculture*, Row, Peterson	.50

DRAWING

BOOKS

Batchelder, E. A., *Principles of Design,* (1904), (Chicago), Inland Printer	$ 3.00
Batchelder, E. A., *Design in Theory and Practice,* Macmillan	1.75
Brown, G. Baldwin, *The Fine Arts,* Scribner	1.25
De Garmo, *Art Appreciation,* (Syracuse, N. Y.) C. W. Bardeen	.40
Dow, A. W., *Composition,* (N. Y.) (7th edition), Doubleday, Page & Co.	3.50
Duval, M., *Artistic Anatomy,* (N. Y.) Cassell	2.50
Edminster, C. F., *Architectural Drawing,* (N. Y.), Williams	2.00
Froehlich, H. B., and Snow, B. E., *Art Education for High Schools,* (1908), (N. Y.) Prang	1.25
Holme, C., ed., *Modern Pen Drawing,* (N. Y.) Lane	4.00
Jackson, T. G., *Lessons in Decorative Design,* (Lond.) Chapman	2.00
Johnston, Edward, *Writing, Illuminating and Lettering,* (London), John Hogg	2.12
La Farge, John, *Great Masters,* McClure, Phillips	2.50
Lilley, A. E. V., and Midgley, W., *Book of Studies in Plant Form,* Scribner	2.00
Longfellow, W. P. P., *Applied Perspective,* Houghton	3.00
Maginnnis, C. D., *Pen Drawing,* (Bost.) Bates and Guild	1.00
Miller, L. W., *Essentials of Perspective,* Scribner	1.50
Morris, I. H., *Geometrical Drawing for Art Students,* (Lond.) Longmans	.60
Mumford, J. K., *Oriental Rugs,* Scribner	7.50
Patridge, W. O., *Technique of Sculpture,* Ginn	1.00
Poore, Henry, *Pictorial Composition,* Baker, Taylor	1.50
Reinhardt, C. W., *Lettering for Draftsmen,* (N. Y.) Van Nostrand	1.00
Reinach, Solomon, *Apollo or the Story of Art Throughout the Ages,* Scribner	1.50
Rimmer, C. H., *Animal Drawing,* Houghton	5.00
Robinson, *Principles of Architectural Composition,* Arch. Record Co.	2.50
Ross, D. W., *Theory of Pure Design,* Houghton	2.50
Ross, D. W., and others, *Illustrations of Balance and Rhythm,* (Bost.) Clarke	3.00
Spanton, J. H., *Complete Geometrical Course,* Macmillan	1.25
Spanton, J. H., *Complete Perspective Course,* Macmillan	1.25

Townsend, W. G. P., *Plant and Floral Studies for Designers,* (N. Y.), Lane	$ 2.00
Tracy, J. C., *Introductory Course in Mechanical Drawing,* American Book Co.	1.80
Western Drawing Teachers' Association, *Annual Reports,* (624 So. Grove Ave., Oak Park, Ill.) Ira Griffith	1.00
Woodbury, C. H., *Pencil Studies,* (Boston) Prang	1.50

PERIODICALS

School Arts Book (monthly), (Boston) School Arts Pub. Co., per year	1.50
Arts and Progress, (Washington, D. C.) American Federation of Arts	2.00
The International Studio (monthly), (N. Y.) John Lane, per year	5.00

MANUAL TRAINING

WOODWORKING

Crawshaw, F. D., *Problems in Furniture Making,* (Peoria, Ill.) Manual Arts Press	1.00
Goss, W. F. M., *Bench Work in Wood,* (Chicago) Ginn	.70
Griffith, Ira S., *Essentials of Woodworking,* (Peoria, Ill.) Manual Arts Press	1.00
Griffith, Ira S., *Correlated Courses in Woodwork and Mechanical Drawing,* (Peoria, Ill.), Manual Arts Press	1.00
Murray, M. W., *Problems in Woodworking,* (Peoria, Ill.) Manual Arts Press	.75
Noyes, William, *Handwork in Wood,* (Peoria, Ill.) Manual Arts Press	2.00
Park, J. C., *Educational Woodworking,* Macmillan	1.00
Ritchey, S. E., *Woodwork,* American Book Co.	1.00

MECHANICAL DRAWING

Bennett, Charles A., *Problems in Mechanical Drawing,* (Peoria, Ill.) Manual Arts Press	1.00
Mathewson, Frank E., *Notes for Mechanical Drawing,* (Springfield, Mass.) Taylor-Holden Co.	1.25

PERIODICALS

American Blacksmith, Buffalo, N .Y.	1.00
Craftsman, New York City	3.00
Manual Training Magazine, Peoria, Ill	1.50

School Arts Book, Worcester, Mass.	$ 1.50
Wood Craft, Cleveland, Ohio	.50
Vocational Education, Manual Arts Press, Peoria, Ill.	1.50

HOUSEHOLD ARTS (DOMESTIC SCIENCE AND ART)

FOODS

BOOKS

Bailey, *Text-book of Sanitary and Applied Chemistry,* Macmillan	$ 1.40
Chittenden, R. H., *Nutrition of Man,* Stokes	3.00
Conn, H. W., *Bacteria, Yeasts and Molds in the Home,* Ginn.	1.00
Dodd, *The Chemistry of the Household,* Amer. School of Home Ec.	1.50
Edgar, W. C., *The Story of the Grain of Wheat,* Appleton	1.00
Farmer, Fannie Merritt, *Boston Cooking School Cook Book,* Little, Brown	2.00
Fletcher, Horace, *A B-Z of Our Own Nutrition,* Stokes	1.00
Green, *Food Products of the World,* Hotel World	1.50
Hill, Janet M., *Up to Date Waitress,* Little, Brown	1.50
Hough and Sedgwick, *Human Mechanism,* Ginn	2.40
Hutchison, Robt., M. D., *Food and the Principles of Dietetics,* Wm. Wood	3.00
Jordan, W. H., *The Principles of Human Nutrition,* Macmillan	1.75
Knight, *Food and its Functions,* Scribner	1.00
Leach, *Food Analysis and Inspection,* Wiley	7.50
Lincoln, Mary J., *Home Science Cook Book,* Whitcomb and Barrows	1.00
Parloa, *Home Economics,* Century	1.50
Pattee, *Diet in Disease,* A. F. Pattee	1.50
Ravenhill, Alice, *Practical Hygiene,* Whitcomb and Barrows	1.50
Richards, *Cost of Cleanness,* Wiley	1.00
Richards, *Cost of Food,* Wiley	1.00
Richards, *Cost of Living, as Modified by Sanitary Science,* Wiley	1.00
Richards, *Cost of Shelter,* Wiley	1.00
Richards, *Handbook of Domestic Science and Household Arts,* Macmillan	1.00
Snyder, Harry, *Chemistry of Plant and Animal Life,* Macmillan	1.25
Snyder, *Human Foods,* Macmillan	1.25
Stiles, Percy, *Nutritional Physiology,* Saunders	1.25

White, Marion, *The Fuels of a Household,* Whitcomb and Barrows ....$	.75
Williams and Fisher, *Elements of the Theory and Practice of Cookery,* Macmillan	1.00

BULLETINS

The following Farmers' Bulletins, issued *free* by the United States Department of Agriculture, Washington, D. C., are valuable:

No. 25. *Peanut Culture and Uses.*
No. 29. *Souring of Milk.*
No. 34. *Composition and Cooking of Meat.*
No. 36. *Cotton Seed and Its Products.*
No. 42. *Facts about Milk.*
No. 62. *Pure Cultures of Bacteria for Cheese Making.*
No. 63. *Care of Milk on the Farm.*
No. 73. *Pure Water; Cooking Vegetables.*
No. 84. *Potatoes as Food.*
No. 85. *Fish as Food.*
No. 87. *Food Value of Eggs.*
No. 93. *Sugar as Food.*
No. 103. *Preserving Eggs.*
No. 105. *Cereal Breakfast Food.*
No. 112. *Bread and Bread Making.*
No. 114. *Skim Milk in Bread Making.*
No. 119. *Banana Flour.*
No. 121. *Beans, Peas and Other Legumes as Foods.*
No. 122. *Selling Eggs by Weight; Flavor of Eggs; Nuts as Food; Coffee Substitutes.*
No. 124. *Distilling Drinking Water.*
No. 131. *Household Tests for the Detection of Oleomargarine and Renovated Butter.*
No. 135. *Sorghum Syrup Manufacture.*
No. 144. *Curing Cheese.*
No. 162. *Cooking of Meat.*
No. 166. *Cheese Making on the Farm.*
No. 169. *Food Value of Beans.*
No. 175. *Home Manufacture and Use of Unfermented Grape Juice.*
No. 183. *Meat on the Farm, Butchering, Curing, Keeping.*
No. 186. *Curing Cheese in Cold Storage, Keeping Quality of Butter.*
No. 190. *Cost of Eggs in Winter.*
No. 193. *Bread and Toast; Cooking Meat.*
No. 202. *Manufacture of Cottage Cheese.*

No. 203. *Canning of Fruits, Preserves and Jellies.*
No. 237. *Cereal Breakfast Foods; Swiss Cheese.*
No. 241. *Butter Making on the Farm.*
No. 244. *Cooking Quality of Potatoes; Food Value of Cottage Cheese.*
No. 249. *Cereal Breakfast Foods.*
No. 256. *Preparation of Vegetables for the Table.*
No. 262. *Water for Table Use.*
No. 281. *Corn as Food for Man.*
No. 295. *Potatoes and other Root Crops as Food.*
No. 298. *The Fireless Cooker; Food Value of Corn and Corn Products.*
No. 305. *Gluten Flours.*
No. 309. *Ice for Household Use.*
No. 316. *Cooking Cereal Foods.*
No. 326. *Macaroni Wheat.*
No. 329. *Cane Sugar and Beet Sugar.*
No. 332. *Nuts and Their Uses as Food.*
No. 342. *Cooking Beans and other Vegetables in the Home.*
No. 348. *Bacteria in Milk.*
No. 353. *The Ice Box.*
No. 363. *Use of Milk as Food.*
No. 374. *Flour for Baking Powder Biscuits.*
No. 384. *Whipped Cream.*
No. 388. *Jelly and Jelly Making.*
No. 389. *Bread and Bread Making.*
No. 391. *Economical Uses of Meat in the Home.*
No. 412. *Milling and Baking Tests with Durum Wheat.*
No. 413. *The Care of Milk and its Uses in the Home.*
No. 535. *Sugar and its Value as Food.*

TEXTILES AND CLOTHING

BOOKS

Carpenter, *How the World is Clothed*, American Book Co....$	.60
Chamberlain, *How We are Clothed*, Macmillan	.40
Dooley, W. H., *Textiles*, Heath............................	1.00
Gibbs, Charlotte, M., *Household Textiles*, Whitcomb and Barrows	1.25
Harman, William, *Textiles Fibres of Commerce*, Chas. Griffin & Co., London	3.00
Matthews, J. M., *Textile Fibres*, Wiley......................	4.00
Woolman, M. S., *A Sewing Course for Teachers*, Seiler......	1.50

BULLETINS

The following Farmers' Bulletins, issued *free* by the United States Department of Agriculture, Washington, D. C., are valuable:

No. 27. *Flax from Seed to Fiber.*
No. 69. *Flax Culture.*
No. 137. *Angora Goat.*
No. 165. *Silk Worm Culture.*
No. 274. *Flax Culture.*
No. 302. *Sea Island Cotton.*

Other valuable bulletins, issued *free,* are as follows:

Office of Experiment Station, Washington, D. C.
No. 33. *The Cotton Plant; History, Botany, Characteristics, Culture and Uses.*

Office of Fiber Investigation, Washington, D. C.
Report, No. 4. *Flax Culture in Ireland, Belgium, Austria, Russia.*
Report, No. 106. *Flax for Seed and Fiber.*

MISCELLANEOUS

Brown, *Baby, a Book for Mothers and Nurses,* Whitcomb and Barrows	$ 1.00
Clark, T. M., *Care of a House,* Macmillan	1.50
Cooley, *Domestic Art in Woman's Education,* Scribner	1.25
Daniels, Fred H., *Furnishing a Modest Home,* Atkinson	1.50
Egbert, *Manual of Hygiene and Sanitation,* Lea	2.25
Hough and Sedgwick, *Elements of Physiology,* Ginn	2.00
Mason, O. T., *Woman's Share in Primitive Culture,* Appleton	1.75
Richards, Ellen H., *Cost of Cleanness,* Wiley	1.00
Richards, *Cost of Food,* Wiley	1.00
Richards, *Cost of Shelter,* Wiley	1.00
Talbot, Marion, *The Education of Women,* University of Chicago Press	1.25
Vail, *Approved Methods of Home Laundering,* Proctor and Gamble, Cincinnati	free

The following books, issued by the American School of Home Economics, Chicago, are valuable:

The House	$ 1.50
Household Bacteriology	1.50
Household Hygiene	1.50
Chemistry of the Household......................	1.25
Household Management	1.25
Personal Hygiene	1.50
Home Care of the Sick............................	1.50
Textiles and Clothing	1.50
Study of Child Life	1.50
Care of Children	1.25

ECONOMICS

For references in General Economics, see page 54. To that might be added:

Bullock, *Select Readings in Economics,* Ginn................	2.25
Fetter, *Principles of Economics,* Century Co.................	2.00
Seligman, *Principles of Economics,* Longmans...............	2.50

COMMERCIAL GEOGRAPHY

Adams, *Commercial Geography,* Appleton..................	1.10
Davis, *Physical Geography,* Ginn............................	1.25
Gregory, Kellar and Bishop, *Physical and Commercial Geography,* Ginn	3.00
Trotter, Geography of Commerce, Macmillan................	1.10

TEACHER-TRAINING COURSES

For library equipment for teacher-training courses, see syllabus issued by State Superintendent of Public Schools, Jefferson City, Missouri.

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UNIVERSITY OF MISSOURI
BULLETIN

VOLUME 15 NUMBER 32

EDUCATION SERIES 8

THE KIND OF SCHOLARSHIP RECORDS TO BE KEPT IN SCHOOLS

BY
MAX F. MEYER
Professor of Experimental Psychology
University of Missouri

UNIVERSITY OF MISSOURI
COLUMBIA, MISSOURI
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The Kind of Scholarship Records to be Kept in Schools.

The scholarship records of any school should permit one to find, in an exact and economical manner and on short notice, (1) the grades received by each *pupil* in each subject; (2) the grades given by each *teacher* during the whole or any fractional period of the years of his or her employment in the school; (3) the grades assigned in any particular *subject* to all the members of a class, for example in arithmetic in the seventh grade of a certain elementary school during a certain year, or in ancient history in a certain high school during a certain year.

It is not asserted that the acquisition of any other data than those mentioned is undesirable, but merely that the above three kinds of data are especially desirable. Any school administration wanting additional data would simply have to amplify the original records in such a manner that the additional data could be extracted from them.

The three kinds of data specified should be recorded on loose filing cards, because such cards can be arranged easily in various groups for the purpose of deriving new kinds of data from them. To facilitate handling, the three sets of cards should be of the smallest standard filing size that permits placing on each card all of the entries likely to occur during the life of the card.

On each card of the first set (see figure 1) should be entered in successive columns from left to right, (1) each subject of instruction during any one year; (2) the number of the year; (3) the name of the teacher of that subject; (4) the grade assigned to the pupil; and further, of course, any other facts desired to be kept on record. The next line should contain the corresponding data for another subject-matter of instruction, and so on. For the same school all these cards ordinarily should be kept in one file and arranged alphabetically according to the names of the pupils.

School:

Pupil:

Subject of Instruction	Year	Teacher	Final Grade

To be continued below as needed.

Figure 1.

In the second set of records (see figure 2) each card should contain, at the top, in exactly the same location, the name of a particular teacher. Successive columns from the left to the right should show (1) the year; (2) the subject taught; (3) the class of the school in which the subject was taught; (4) the absolute numbers of grades assigned to the class in the subject, recorded in the same number of columns as the number of grades or marks officially adopted by the school; and (5) in an equal number of columns, the percentage which the number of each grade is of the whole number of grades assigned to the class in the subject. The next line should contain the corre-

School:

Teacher:

Year	Subject of Instruction	Class	E	S	M	I	F	%E	%S	%M	%I	%F
	To be continued below as needed.											

Figure 2.

sponding data for another subject, year, class, etc., for the same teacher. Each school, therefore, should keep as many cards of this kind on file as it employs teachers. As new teachers are employed, new cards should be added. The old cards should be preserved for some years after a teacher has ceased to be employed by the school.

In the third set of records (see figure 3), each card should contain, at the top, a fourfold heading: the name of the school, the year, the name of the class ("junior" or "fifth grade"), and the name of the subject-matter, each of these four placed in a corresponding location on all the cards in a definite blank space provided for each of the four items. Below should be found two lines, one for the absolute number of grades, and the other for the percentage which the number of each grade is of the whole number of grades given. The first column should contain the numbers, actual and percentage, of the "A" grades; the second column, those of the "B" grades; and so on, in the same number of columns as the number of marks officially adopted by the school. At the bottom there should be a blank for the name of the teacher.

School: .... Year: ....

Class: ....

Subject of Instruction: ....

Grades	E	S	M	I	F
Actual Number					
Per Cent					

Teacher: ....

FIGURE 3.

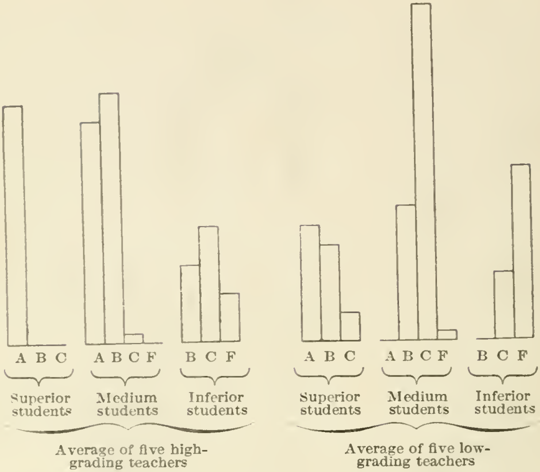
The cards of the third set should ordinarily be filed according to the year. Within the set of each year the cards should be arranged so that one class comes first, another following, and so on. Furthermore, each group of the same class should have an alphabetical sub-arrangement according to the subject-matter. Temporarily, however, the cards could be grouped together differently, if particular data are to be extracted. For example, all cards of the same subject-matter should be grouped together for several or even for all the classes of the school, and even for a period of several years. One could thus, for example, by adding together the corresponding figures of each card, easily give an answer to this question: In English, in the junior and senior classes of a certain high school, during the years from 1910-11 to 1913-14, how many times has the grade "A" been given, how many times the grade "B," and so on? After the new arrangement has served its purpose, the cards should be redistributed according to the normal plan.

It is clear that the first set of records will be valuable especially to those whose interests center in the individual pupils and the progress made by them. The second set of records will be valuable especially when anybody needs information as to how the individual teacher performs his or her duties. Such information will frequently be needed by the principal, the superintendent, the school board. The third set of records will be valuable especially when information is needed about the efficacy of instruction in a whole school or a whole school system. Such information will be needed by superintendents, local or state, by school boards, and by the officers of higher institutions of learning receiving their pupils from the school or school system in question. Any one having a complete system of records of this kind at his disposal will soon be surprised, not only at its helpfulness in meeting demands and inquiries coming from the outside, but at its suggestiveness in calling the administration's attention to problems of which nobody had thought previously.

One of the first discoveries which the teacher, principal, or superintendent, keeping scholarship records, will undoubtedly make is this: that there seems to be something wrong with the original, individual grade reports. It will appear, for example, by comparing the grades or marks given by various teachers, that in a certain group of pupils, large enough to represent an average class made up of some excellent, some poor, and a good many ordinary pupils, one teacher gives proportionately a much larger number of high grades than another. The grade "A" (or, say, 90-100, if these are the symbols used by the school) may be found to have been given approximately to three-tenths, or thirty per cent, of that group of pupils by one teacher, and to only one-twentieth, or five per cent, by another teacher. Of course, this does not mean that the latter teacher was a poorer teacher than the former. No teacher would inform other people in this naive manner that he is a poor teacher. The fact mentioned simply indicates that one teacher had an idea of what "A" meant differing from that of the other teacher. There is nothing strange in this. Rather, it would be miraculous if the meaning of "A" were the same in two persons when all that they had been informed about the meaning of "A" was that it was the highest grade, "B" the second grade, "C" the third, and so on.

About eight years ago, when in the University of Missouri interest was first taken in this matter, facts were found no better than those of the example above. The grades given by forty University of Missouri teachers, all having rather large numbers of students, were compared. The accompanying figure compares the average grades of the five teachers representing the one extreme of the forty with the average grades of the five representing the other extreme. For the sake of a better comparison, the students are divided into three groups. The first group includes the best quarter of all the students. These are called superior students. The second group includes that half of the students which has as many better students above as poorer students below. These are called medium students. The third group includes the poorest quarter of all the students. They are called inferior students. At the time when this comparison was made, three passing grades, called "A," "B," and "C," were used in the University. Now look at the figure on page 8.

All the superior students received the grade "A" from the high-grading teachers. But the low-grading teachers gave the same class of students very different grades. Less than one-half received "A." An almost equal number received "B." And not an inconsiderable fraction of the students received even



"C." Now let us look at the grades received by the medium students. The high-grading teachers reported nearly one-half of this class of students as "A," one-half as "B," and an insignificant fraction as "C." But the low-grading teachers reported none as "A," less than one-third as "B," more than two-thirds as "C," and a few even as failures. Let us further look at the grading of the inferior students. The low-grading teachers reported more than two-thirds of them as failures, less than one-third as "C." But the high-grading teachers reported only one-fifth of these students as failures, about one-half as "C," and three-tenths even as "B."

Think of the government of a nation, prescribing that each citizen pay an income tax, but leaving it to each citizen's notion to determine what percentage of his income he ought to contribute. Each citizen would then grade, so to speak, by the amount of tax he paid, not the amount of his income, but his moral and social convictions. The treasury department would then have, in the list of the tax payers, first one who is willing to contribute, say ninety-seven per cent, then one who believes in contributing, say ninety-four per cent, and so on to the most miserly citizen. The treasury department, however, does not want this. It wants a list of the taxpayers according to income, not according to willingness to pay. We would laugh at a government requiring each citizen to pay an income tax, but failing to state what percentage of the income must be paid. We should likewise laugh at a school administration telling its teachers to report some "A" grades, some "B" grades, some "C" grades, and so on, but failing to state the percentage of "A" grades, "B" grades, "C" grades, and so on. Each teacher, in reporting, would then unwittingly grade, not his pupils so much, but rather himself, his own notion of what ought to be done. That is, one would report that according to his conviction a teacher ought to report only, say, six per cent "A" grades; another would express his conviction that a teacher ought to report, say, twelve per cent "A" grades; a third would grade himself as believing in eighteen per cent "A" grades; and so on to the most liberally grading teacher. But the school administration does not want its teachers thus to grade themselves. It wants them to grade their pupils, so that one may tell who is the best kind of scholar, who a less good scholar, and who a very poor scholar.

Any school administration keeping scholarship records will soon find out to what extent its teachers grade their own convictions rather than the scholarship of their pupils. Divergences in the percentage of each grade among the several teachers will indicate whether the teachers have the same or different notions of the meaning of each grade. If the divergence is considerable, the practical question is how to reduce it. It is clear that it ought to be brought to the attention of those teachers who report, say, too many B's and too few C's, that they diverge thus from the majority of their colleagues and how much they diverge.

This may or may not be sufficient to bring about the desired uniformity of grading. The teachers, being reasonable beings, may understand that scholarship records kept by the school are worthless, if, instead of being scholarship records, they are a confused kind of record of what the several teachers believe the various grades ought to mean. But even reasonable beings are sometimes unreasonable. Those being in the minority might think that, since majorities are not necessarily always right, here is such a case in which the minority is right, and might regard it as their duty to stick to their convictions.

It is preferable, therefore, to avoid the raising of such questions altogether by adopting officially definitions of the grades which every teacher must accept in taking office. The question then is this: How can the administration of a school or school system define the meaning of the grades? This question is easily answered. As has been seen, the lack of definition of the grades is likely to result in the records showing an unduly high or unduly low percentage of certain grades. The simplest way of defining any grade is therefore obviously to state to what percentage of the whole number of pupils graded should be assigned this grade, and to what percentage of the whole number of students graded should be assigned a higher grade, and to what percentage should be assigned a lower grade. In other words, each grade is defined by the *relative frequency* of its occurrence among a hundred grades, that is, *per centum*.

This is not only the simplest way of defining scholarship grades; it is at present, and undoubtedly will be for a long time, the only one universally applicable. Of course, absolute standards, units of measurement, are desirable in education as in any science; and indeed a few have been worked out with fair success for certain kinds of subjects, as writing, composition, and arithmetic. But for universal application to a school system, absolute units are as yet out of the question.

It is of minor importance what the frequencies are which are officially adopted as definitions of the grades. At the same time, however, it means a saving of time and energy in comparing different schools if these schools use the same or about the same frequencies. The University of Missouri uses the following: The grade "Medium" is defined as indicating that in a class of one hundred students the student so graded would be found among the students above whom there are twenty-five better ones and below whom there are twenty-five poorer ones. If the classes are small, the grades should conform to this distribution in the long run. The best fourth of the students are called superior and the poorest fourth are called inferior. Those above are subdivided so as to give to the best (say, four or five among each twenty-five) the grade of "Excellent," to the others simply the grade of "Superior." Those below also are subdivided so as to give to the poorest among each twenty-five the grade of "Failure," to the others simply the grade of "Inferior."

The reasons for this particular system will be stated briefly. It is better to have an odd number of grades than an even number of grades. An even number of grades, for example six, would divide an array of students in the middle. But this is the very place where a division point is least needed. Divisions should be made where people vary greatly. Average people, however, vary least one from another. An odd number permits giving one grade to the large group of average students. To choose one-half of all as the frequency of this group, is simply to follow the custom prevailing among statisticans. The one-quarter above and the one-quarter below have been subdivided because three grades seemed to be too few to do justice to the students. On the other hand, seven, the next higher odd number after five, seem to be too many. Experiments which have been made seem to indicate that no greater accuracy is gained by using seven or more grades. When seven grades are used it becomes almost a mere matter of chance whether a student is placed in the first rather than in the second group, or another student in the second rather than in the third, and so on. The ability of the teacher to make distinctions of scholarship soon reaches its limit when an attempt is made to distinguish more than five classes.

It is evident that the original task of the teacher, using such a grading system with defined grades, consists in *ranking* his or her pupils; that is, in putting down one as the best, another as the second best, a third one as the third best, and so on, down to the very poorest in the class. Having done this, the teacher divides the whole array into five groups, according to the frequencies given in the official definitions. If the class is small, the teacher must use the best judgment possible in assigning grades so that *in the long run* the distribution of the grades given will be in accordance with the definitions. If the judgment of a teacher, or of all the teachers of the school, is bad in this respect, it will soon show in the cumulative scholarship records.

School grades do, and ought to, indicate simply a pupil's rank among other pupils doing the same kind of work. Rank is not used here in the individual sense that Mary Gray ranks between John Brown and Frank White, which may be true, but is of minor importance; but it is used in the general sense, which alone is important, that Mary Gray among thousands of pupils would rank in the group of the average, or in the group of the superior ones, or in the group of the inferior ones. This is what parents want and ought to be able to know, in order to decide whether they ought to make sacrifices to send Mary to high school or to college. This is also what the college wants to know, before it admits a high school graduate. But this information can be obtained with sufficient reliability only from a school which keeps careful scholarship records.

There are some practical questions of secondary importance upon the discussion of which we cannot enter here. One question, however, might be touched upon. It is often asked whether a grading system with grades defined by their frequencies can be applied to selected classes. The answer is this. It depends on the purpose for which the class was selected. If the selected class is doing the same kind of work which an unselected class is doing, then the selected class should obtain an increase in the number of higher grades corresponding to the degree of selection. But if this class was selected for the very purpose of doing selected work, then the normal frequencies should be strictly applied. Otherwise, we would once more indicate by the grading assigned the fact already known, that these individuals were selected. But we would fail to indicate what is really important, namely, who can do this selected work best, who next best, who less well, and who least well. For example, if college students were selected from high school students in order to do in college some further high school work, then indeed college students would deserve higher grades than high school students. But they have been selected to do selected work, college work; and therefore the same system of grading is applicable to the college as to the high school and to the elementary school and to each subdivision of these institutions.

For the same reason the same percentages of the grades are, in general, applicable to a class in a subject which the teacher considers as unusually hard or unusually easy. It is pedagogically wrong to teach any subject in such a manner that it is unusually hard or unusually easy. Any subject in any class ought to be taught in a manner suited to the majority of the members, neither the worst nor the best, of the class. Instead of applying a different method of grading, the teacher ought to apply a different method of teaching; that is, a method better adapted to the majority of his class. If, however, the class has been selected —whether intentionally or unintentionally—with the result that only scholars unusually poor in the subject are found in the class doing unselected work, then the percentages of the lower grades may be increased. Or if as the result of selection only scholars unusually good in the subject are found in the class doing unselected work, then the percentages of the higher grades may be increased. But the cases are exceedingly rare in which the conscientious teacher, trying to prove that the membership of his class is unusual, will find this proof forthcoming.

Further information about practical and theoretical questions concerning scholarship records, grading systems, and examination methods helpful to sound grading, may be obtained from the literature given in the appended bibliography, which is arranged in chronological order.

BIBLIOGRAPHY.

1902. Hyde, W. D., *The Adjustment of the Small College to our Educational System.* (Credit for Quality.) The Outlook, Vol. 71, p. 866.

1903. Stevens, W. L., *American Titles and Distinctions.* Popular Science Monthly, Vol. 63, p. 310.

1904. Sargant, E. B., *Education of Examiners.* Nature, Vol. 70, p. 63.

1905. Cattell, J. M., *Examinations, Grades, and Credits.* Popular Science Monthly, Vol. 66, p. 367.

1906. Hall, W. S., *A Guide to the Equitable Grading of Students.* School Science and Mathematics, Vol. 6, June, 1906.

1908. Meyer, Max F., *The Grading of Students.* Science N. S., Vol 28, p. 243.

1910. Dearborn, W. F., *School and University Grades.* Bulletin of University of Wisconsin, No. 368.

Huey, E. B., *Retardation and the Mental Examination of Retarded Children.* Journal of Psycho-Asthenics, Vol. 15, p. 31.

Judd, C. H., *On the Comparison of Grading Systems in High Schools and Colleges.* School Review, Vol. 19, p. 460.

1911. Foster, W. T., *Scientific Versus Personal Distribution of College Credits.* Popular Science Monthly, Vol. 72, p. 388.

Foster, W. T., *Administration of the College Curriculum.* Houghton Mifflin Co., Boston. Chapter 13.

Smith, A. G., *A Rational College Marking System.* Journal of Educational Psychology, Vol. 2, p. 383.

Steele, A. G., *Training Teachers to Grade.* Pedagogical Seminary, Vol. 18, p. 523.

Weiss, A. P., *On Methods of Mental Measurements in Schools and Colleges.* Journal of Educational Psychology, Vol. 2, p. 555.

Meyer, Max F., *Experiences with the Grading System of the University of Missouri.* Science N. S., Vol. 33, p. 661.

Karapetoff, V., *Letter on Examination Questions.* Bulletin of the Society for the Promotion of Engineering Education, Vol. 2, p. 115.

1912. Sies, R. W., *Scientific Grading of College Students.* University of Pittsburgh Bulletin 8, No. 21.

Foster, W. T., *Scientific Distribution of Grades at Reed College.* Science N. S., Vol. 35, p. 887.

Weiss, A. P., *School Grades—To What Type of Distribution Shall They Conform?* Science N. S., Vol. 36, p. 403.

Colvin, S. S., *Marks and the Marking System as an Incentive to Study.* Education, Vol. 32, p. 560.

Weiss, A. P., *The Ebbinghaus Conjectural Method of Examination.* Journal of Experimental Pedagogy, Vol. 1, p. 320.

Smith, F. O., *A Rational Basis for Determining Fitness for College Entrance.* Studies in Education, University of Iowa, I, 3.

1913. Starch, D., *Reliability and Distribution of Grades.* Science N. S, Vol. 38, p. 630.

Gray, C. T., *Variations in the Grades of High School Pupils.* Educational Psychology Monographs, No. 8.

Herschel, W. H., *Scientific Ranking Systems.* Bulletin of the Society for the Promotion of Engineering Education, p. 529.

Finkelstein, I. E., *The Marking System in Theory and Practice.* Educational Psychology Monographs, No. 10.

1914. Bovet, P., *Le Rendement du Travail Scholaire.* L'Education en Suisse, Xe année, Geneva.

Maxwell, G. E., *The Grading of Students.* Winona (Minnesota) Normal Bulletin.

Hyde, A. L., *The Grading System of the University of Missouri.* Bulletin of the Society for the Promotion of Engineering Education, p. 173.

Cajori, F., *A New Marking System.* Science N. S., Vol. 39, p. 874.

Boring, E. G., *The Marking System in Theory.* Pedagogical Seminary, Vol. 21, p. 269.

Meyer, Max F., *Scientific Institutions Minus Science.* Science N. S., Vol. 39, p. 535.

Woolley, P. Q., *Premedical Education* (Credit for Quality). Science N. S., Vol. 39, p. 750.

Meyer, Max F., *The Limit of Uniformity in the Grading of College Students.* Science N. S., Vol. 40, p. 530.

Coursault, J. H., *Grading System Adopted by the University of Missouri.* The Ohio State Lantern, Vol. XXXIV, No. 8 and No. 9.

Ruediger, W. C., Henning, Geo. N., and Wilbur, Wm. A., *Standardization of Courses and Grades.* Science N. S., Vol. 40, p. 642.

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